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CONTENTS.

	PAGE
AGRICULTURE—	
Onion-growing in the South Burnett District	... G. B. Brooks 83
The History of Cotton Growing in Queensland—No. 2	The Editor 84
Wheat Variety Tests ..	... ... ... ... ... 89
Destroying Stumps with Acids	... ... ... ... ... 90
A New Method of Fertilizing the Soil	... ... ... ... ... 93
A Few Observations on the Raising of Winter Fodder Crops	G. B. Brooks 95
DAIRYING—	
The Dairy Herd, Queensland Agricultural College, Gatton	... 96
POULTRY—	
Report on Egg-laying Competition—Q. A. College, December, 1913	97
Maize and Fowls	... ... ... ... ... 98
TIMES OF SUNRISE AND SUNSET AT BRISBANE, 1914	
	... ... ... 99
STATE FARMS—	
Gindie, Roma, Kairi, Kamerunga	... ... ... ... ... 104
CALENDAR FOR 1914	
	... ... ... ... ... 104
THE ORCHARD—	
Cincturing Fruit Trees	... ... ... ... ... 105
Diseases in Citrus Fruits	... ... ... ... ... 107
HORTICULTURE—	
Daffodils	... ... ... ... ... 108
STATISTICS—	
Rainfall in the Agricultural Districts	... ... ... ... ... 109
TROPICAL INDUSTRIES—	
Queensland's Record Sugar Crop	... ... ... ... ... 110
Notes on Date-growing	... ... ... ... ... 112
VALUABLE WHEATS ...	
	... ... ... ... ... 115
ENTOMOLOGY—	
Sheep Maggot Fly Pest	... ... ... ... ... 116
BOTANY—	
Contributions to the Flora of Queensland	F. M. Bailey, C.M.G., F.L.S. 124

		PAGE.
GENERAL NOTES—		
Coconuts—the Consols of the East ...	...	128
The Water Hyacinth as a Fibre Plant	...	128
PUBLICATION RECEIVED—		
Cabinet Timbers of Australia...	...	R. T. Baker 129
ANSWERS TO CORRESPONDENTS—		
Budding the Mango ...	...	130
Brussels Sprouts	...	130
THE MARKETS—		
Prices of Farm Produce in the Brisbane Markets for January, 1914	...	131
Southern Fruit Markets	...	131
Prices of Fruit—Turbot-street Markets	...	132
Top Prices, Enoggera Yards, December, 1913	...	132
FARM AND GARDEN NOTES FOR MARCH		133
ORCHARD NOTES FOR MARCH		134
LIST OF AGRICULTURAL AND HORTICULTURAL SOCIETIES		I.
DEPARTMENTAL ANNOUNCEMENTS ...		VI

FEB., 1914.⁷

QUEENSLAND AGRICULTURAL JOURNAL.

N O T I C E .

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VOL. I.

FEBRUARY, 1914.

PART 2.

Agriculture.

ONION-GROWING IN THE SOUTH BURNETT DISTRICT.

By G. B. BROOKS, Instructor in Agriculture.

The largest area met with (30 acres) was that on Mr. A. B. Postle's farm, Memerambi, this, I believe, constituting a record for Queensland.

Last season this gentleman raised 1½ acre, which I inspected during the early steps of growth. This patch was somewhat thin owing to the dry conditions prevailing subsequent to planting. Notwithstanding this, I was informed that the return from the 1½ acre was over £70 in cash.

It may be mentioned that while at the Toowoomba Show, Mr. Walsh, seedsman, donated a bag of large, well-grown onions from this crop for exhibition purposes. These were exhibited at the various shows for a period of some 5 months, proving that their keeping qualities were excellent.

The present crop at the time of my visit (20th October) was looking very healthy, a good germination having been secured. The varieties grown are the long-keeping Brown Spanish (24 acres) and Early Globe (6 acres). Planting was carried out during the latter end of May, in rows 20 in. apart, the seeding being at the rate of 2 lb. per acre.

At the time of my visit the plants had developed to the thickness of a lead pencil, and were just beginning to bulb. Mr. Postle anticipates to harvest about March.

A portion in the centre of the field, where cowpeas had been grown the previous season, showed a much more advanced growth. It will be interesting to note what effect this will have on the yield.

Several other farmers in the district are experimenting with this crop in a small way, viz.:—J. Todd, 1½ acre; R. Gatacre, 2 acres; L. Coe, 2 acres; R. Laycock, ½ acre; G. Glen, 1½ acres. Unfortunately time did not permit my visiting these growers.

The soil in this district is a deep, friable chocolate loam of volcanic origin, and is undoubtedly suitable for the production of heavy crops of good quality onions.

The only obstacle that is likely to keep this industry from developing into large proportions is the want of knowledge in regard to the working of the soil so as to keep the crop clean, thereby reducing the cost of weeding, which is at present a heavy item. For instance, Mr. Postle was paying £1 per acre for a single weeding, and this was in addition to the cost of scuffing.

The common practice of ploughing and putting the land in order just previous to planting cannot be too strongly condemned in onion culture.

It will be found necessary—more especially in land that has been cropped for some years—to put the land into tilth some months ahead of planting. If this is carried into effect, and frequent stirring made, most of the weed seed will be induced to germinate, when complete destruction will be easy. Owing to the difficulty in securing reliable labour, up-to-date implements will also have to be used for the after cultivation of the crop as well as for harvesting purposes.

In addition to the areas around Memerambi, Messrs. Springthorpe Bros., Goomeri, have also 5 acres. The varieties grown are E. Barbete, Tripoli, Early Globe, Flat Red, and Giant Rocker. These were planted about the middle of March, on forest land, the soil being a rather heavy brown loam.

Of the varieties experimented with, the Giant Rocket gives promise of giving the best results, the Flat Red coming next. All sorts developed thick necks, possibly due to a combination of circumstances, such as heavy soil, early planting, and the varieties grown. Harvesting will commence about the end of November.

Were proper cultural methods observed, there is no reason why this industry should not expand into very large proportions.

THE HISTORY OF COTTON-GROWING IN QUEENSLAND—No. 2.

BY THE EDITOR.

SECOND PHASE, 1890-1897.

The first period of the Cotton Industry in Queensland had been, as has been shown in my first article on the subject, productive of results which gave rise to the hope, indeed almost to the certainty, that cotton-growing in the State had been established on a solid basis; but, as I also explained, this hope was shattered by the resumption of cotton exports from the United States, shortly after the close of the war of secession

in the United States of America. Referring for a moment to the first phase of the industry, it will be noted that in 1871 our heaviest export of ginned cotton amounted, in round numbers, to 2,500,000 lb., equal to 6,505 bales.

From that date the production of cotton declined year by year, until, about the year 1887, the industry practically died out.

Three years later, however, an impetus was again given to the cultivation of the plant. This was owing to the offer by the Queensland Government of a bonus of £5,000 for the first 5,000 yards of cotton fabrics manufactured by any enterprising Queensland company who might be thus induced to establish a cotton mill in the State. Such a company was soon formed; a mill, with all necessary appliances for spinning and weaving the fibre, was erected on the banks of the Bremer River, at Ipswich. An apparently permanent market being thus assured, the farmers once more planted cotton, and received remunerative prices for their crops. As it had long since been proved that cotton cultivation in this State could not be successfully carried on on the old American "plantation" system, the Ipswich mill depended on the aggregate of small supplies from farmers who planted from 5 to 30 acres each, and it is probable that serious delays occurred owing to supplies being intermittent. However that might have been, the company managed to produce the necessary 5,000 yards of cotton fabric, and duly received the Government bonus of £5,000. Eventually it was found that, for various reasons, the company could not carry on, and had to succumb to adverse circumstances and go into liquidation.

On the closure of the mill cotton-growing in Queensland ceased, and was not revived until five years later, when the industry entered on its

THIRD PHASE, 1902-1912.

About this time, an Italian gentleman, Dr. David Thomatis, established a cotton plantation near Cairns, and, undeterred by the collapse of the industry in the South, devoted himself to the evolution of a totally new variety of long-stapled cotton by crossing, I believe, Sea Island with a variety which he procured in 1901 from the Savery River (a tributary of the Amazon), on the borders of Peru and Brazil. In these experiments he was so successful that the new variety, which he named "Caravonica," not only obtained the highest price for long-staple tree-cottons, but was awarded a gold medal at the Tourcoing (France) International Exhibition. So valuable was this cotton considered that the seed readily sold at 10s. per lb. Eventually Dr. Thomatis sold his plantation, which he had successfully worked during all the years of depression, for a very large sum, and travelled all over the cotton-growing world in the interests of foreign Governments. His plantation is to-day being carried on under the name of "Gossypium Park" by a company, and considerable quantities of Caravonica cotton are annually exported. In 1902, the Queensland Government, fully alive to the great value of the industry to the State, if it could be revived, decided to come to the farmers' assistance.

The State had just passed through a very long and serious drought, which came to an end in 1902. It was noticed that whilst the usual farm crops had failed all over the country, yet, wherever cotton was still growing, it was found to have resisted the drought. Consequently, the Department of Agriculture, having its attention drawn to this circumstance, took steps in, I think, 1904, to induce farmers to once again engage in cotton-growing.

To this end, a quantity of seed was imported from America and Egypt, which was distributed free to all who would undertake to give cotton-growing another trial. The Department offered to make them an advance on their crops, and to gin, bale, and market their crops for them, paying them, less expenses, the full value of the lint which would be sold either in the British or Australian market.

Many farmers took advantage of the liberal offer, and planted small areas as a commencement. Judging by the results of the crops of 1907, it was abundantly proved that cotton-growing in Queensland would pay handsomely without any recourse to cheap labour of any kind. Those results were as follow:—

	Acres.	Yield, Seed Cotton.		Value.	Value per Acre.
		Lb.	Lb.		
W. G. Giles, Wallumbilla	...	1	2,240	14 0 0	10 0 0
W. Goos, Tallegalla	...	2½	4,250	26 11 3	11 13 0
C. Pointing, Tallegalla	...	2	3,527	22 0 3	11 0 1
C. Litzow, Vernor	...	2	3,006	18 15 9	9 7 10
F. Baumann, Vernor	...	1½	1,300	8 2 6	6 10 0
O. Adermann, Vernor	...	1	1,473	9 4 2	9 4 2

A Mackay farmer reported his yield from a small area as being equal to 1,368 lb. to the acre; value, £8 11s.

When the cotton was sold it realised 6d. per lb.

Thenceforth, encouraged by this satisfactory result, the farmers planted larger areas, until, in 1911, there were 605 acres devoted to this crop. I believe that this rerudescence of the industry was largely due to the enterprise of Messrs. Joyce Bros., who had purchased the Ipswich cotton mill, where they manufactured large quantities of cotton goods, especially a cottonette, which was utilised on banana plantations to protect the fruit against the attacks of the fruit-fly.

Unfortunately, the firm were unable to compete against imported goods of the same class, and repeated applications to the Commonwealth Government to give them some protection in the way of import duty on foreign cotton goods, elicited no response, with the result that the firm closed their manufacturing works in 1912.

This market being no longer available, the farmers in the Southern and Central districts again reduced their cotton areas to 441 acres in 1912, and in 1913 there was very little cotton produced in those parts of the State.

To show how profitable the industry might be, if determinedly followed up: In 1912 the Queensland Department of Agriculture bought

a parcel of cotton seed from a person arriving from Egypt, who intended to start cotton-growing in Queensland, but who was prevented from doing so owing to his having to leave for England. I obtained some of this seed, and the product was sent to England to the Imperial Institute in London by the Department, for a commercial valuation, and although it was from the first crop, and, consequently, had not been acclimatised, the comparative value is interesting.

The Institute found that the first grade was worth 12½d. per lb., with "Choice Georgia Sea Island" cotton at 13d. per lb., and "Fancy Florida" at 14d. The inferior or second-grade sample was valued at 9·25d. per lb., as against "Good Fair Egyptian" at 9·80d., and "Good Fair Noubari" at 10·20d. per lb. These prices were highly satisfactory, and it is probable that, had the industry not received the set-back by the closure of the Ipswich factory, further cultivation would have increased the commercial value of these cottons in the English market.

In the Cairns district, in North Queensland, the Gossypium Park Company, above mentioned, still carries on the cultivation of the valuable Caravonica cotton, but I have no knowledge of what the crops yield per acre, or at what price the ginned cotton is sold. That they are carrying on is at least satisfactory evidence that the plantation must be paying. Aboriginals are employed on this plantation, who receive good wages and are under the supervision of the Chief Protector of Aboriginals.

We now come to the year 1913, when the Minister for Agriculture, the Hon. J. White, determined to make another effort to resuscitate cotton-growing in the State.

Cotton seed was purchased and was distributed gratis to such farmers as were willing to make another trial of the industry. The Department offered to take all raw cotton from the growers, make them an advance of 1½d. per lb., gin, bale, and market the cotton, and sell it in the best market, either in England or Australia. Whatever balance to credit is shown when account sales are received in 1914, will be distributed amongst the growers according to the quantity of cotton supplied by them, deducting only the bare expenses of preparing the shipments, freights, &c. The seed, which has always been a negligible quantity in the palmy days of cotton-growing in the State, now has a good market value and will probably be a factor in increasing the profits of the growers.

The Colonial Office, London, on 27th November, 1913, announced an agreement in principle between the Commonwealth, the Queensland Government, the Dominions Royal Commission, and the British Cotton Growers' Association in regard to cotton-growing in Australia.

The sum of £1,500 has been promised, including a grant of £100 per annum for three years, by the association to secure skilled advice, and to carry out practical experiments with various cotton seeds.

The British Cotton Growers' Association also guarantees for three years from July next to pay a minimum net price of 6½d. per lb. in Liverpool for cotton according to specified description.

With reference to this cablegram, the Premier of Queensland, Mr. Denham, said that, so far as he was aware, the matter was in a somewhat indefinite state, the latest advice from the Agent-General being that no action should be taken by the Government until mail advices came to hand in Brisbane. The question arose at the beginning of October, when the Agent-General cabled that the Colonial Office had informed him that as a result of the visit of the Dominions Royal Commission to Australia a conference between the Commission and the British Cotton Growers' Association had been arranged to be held at the Colonial Office on 22nd October. The Agent-General said he had been invited to be present. The attendance of Sir Thomas Robinson was approved, and in order that he might be familiar with the present position in Queensland, Mr. Denham cabled particulars of the steps taken by the Department of Agriculture to gin and market cotton. It was suggested that if 6½d. per lb. was paid for a fixed term it would be sufficient to ensure cultivation in Queensland. The British Cotton Growers' Association made proposals and offers of assistance, and asked the Queensland Government if the amount would be supplemented. Numerous cablegrams have passed since, and as a result it was agreed that the Commonwealth should give the sum of £500, the British Cotton Growers' Association £300, and the Queensland Government £700. The Queensland Government was willing to do this provided that the services of an expert, whom it was proposed to send out, should be exclusively employed in Queensland. If he was to be engaged in other States, Mr. Denham considered that the amount to be paid should be divided proportionately between the States participating.

Such is the position of the cotton industry in Queensland at the end of the year 1913.

It must be remembered that no black labour is employed in the Southern or Central Districts in the cotton-fields, and that there is only one plantation in the State which is worked on the "plantation system"—in the North, as I have already explained.

In all other districts, cotton is merely a subsidiary crop, and in the best of times few farmers exceeded an area of from 5 to 20 or 30 acres under that crop.

To conclude: It has been conclusively proved that there are tens of thousands of acres ideal for cotton-growing, in all parts of the State, both on the coast and inland, and nowhere has the crop been found to fail. As to pests, the cotton plant in Queensland is exempt from that scourge of the cotton States of America—the Boll Weevil, and also from the American Cotton Stainer. The Boll worm (really, the maize cob worm) we have, but it is a simple matter to prevent its ravages by planting "trap crops" of maize—five rows of maize to each twenty-five rows of cotton. Cotton-leaf wilt and root rot are scarcely known here.

It is expected that the British Cotton Growers' Association will shortly co-operate with the Queensland Government in forwarding the industry, and negotiations to that effect are proceeding at the time of writing.

WHEAT VARIETY TESTS.

In July of last year, the Director of Agriculture in South Australia forwarded several samples of wheat to Mr. F. Grayson, M.L.A., Warwick, representing a selection of the varieties most in favour in the State mentioned. These wheats were distributed to the State Farm at Roma, and the Hermitage State Farm, Warwick—unfortunately arriving too late in the season to obtain the best results. Appended is the report on the results by the manager of the Roma State Farm.

DESCRIPTION OF WHEATS.

Thew.—Is very early, medium tall, and a fair stooling variety. The young growth is vigorous, spreading, and of good colour. It has a medium amount of foliage, which is green to the base of the plant. The leaves are rather stiff and narrow. When ripe, the straw is white, not very stout, and inclined to be weak under good conditions. The spikelets are fairly open, chaff white, small, and not very close.

Correl's No. 7 (Western Australian variety).—A late wheat, with broad leaves, susceptible to rust. Has a nice large grain.

Glycas.—An early variety. It is a fair storer and vigorous grower with weak straw. The heads are beardless, bronzed, and pendant, and hold the grain well.

Firbank.—A very early, good hay wheat, with soft straw of excellent colour and quality. It is a tall grower, stools moderately. The ears are long and open and have a tapering tip. The chaff is small and white.

Federation.—A midseason wheat, and essentially a grain yielder. The head is square, with a peculiar and characteristic bronze cast; upright, beardless, and, while easy to strip, the grain does not readily shake out. The foliage of the young plant has a characteristic bright green colour, and possesses broad, stiff, pointed leaves.

Huguenot.—A late variety, a very tall grower, but a sparse storer. It has an upstanding, practically solid straw, very sweet in character. It belongs to the Macaroni type of wheat, possessing a high gluten content, considerable strength, but the colour of the flour is very inferior, and it is therefore objectionable to the miller and baker. It is a hardy grower and needs to be sown rather thickly to secure a good sample of hay.

Comeback.—A vigorous grower, medium early, a good storer, with tall clean straw, and makes a very fair sample of hay. The head is of medium length, beardless, smooth, and white, but the tip of the head is defective. It is a most excellent milling variety.

Crossbred No. 28.—Is very early, medium tall; the young growth is vigorous, rather spreading, and of good colour. Straw is white, not very stout, and inclined to be weak under good conditions.

RESULTS OF TESTS.

The seeds of these varieties, which it is understood represent those most in favour in South Australia, were received too late in the season to obtain the best results, as they did not reach here until the 12th

July. The grain was put into the ground on the same day as received: conditions being favourable for germination, the plants appeared in ten days. During the ten weeks subsequent to germination only 35 points of rain were experienced.

These conditions, in conjunction with the already mentioned lateness of sowing, prevented the plants from making anything like normal growth, so that anything more than the actual results obtained cannot be given. These in themselves afford very little information as to the suitability or otherwise of the varieties, when a comparison is made with data obtained in other sections where similar kinds are grown under seasonable conditions.

Of the wheats received some had already been tested here, viz.:— Federation, Huguenot, Gluyas, and Comeback since 1907, and Firbank and Thew in the previous season, and this has afforded an opportunity of arriving at the individual characteristics of each; Correll's No. 7 and Crossbred No. 28 being the only varieties we were unacquainted with.

When the sowings were made a drill of a crossbred raised here, B x B lb., was put in for control purposes.

NOTES ON WHEATS.

Variety.	Length of straw.	Stooling.	Rust.	Season.	Yield.	Remarks.
Comeback ...	Ft. in. 2 7	Good	Rusty	Mid ...	oz. 3	Hot winds and rust reduced yield, the ears curing off instead of maturing naturally Ditto ditto
Correll's ...	2 3	Fairly good	„	Late ...	6	
Federation ...	2 0	Good	„	Medium	10	Ditto ditto
Firbank ...	3 0	Fair ...	Free ...	Medium early	10	Not so much affected by hot winds, and rust absent
Gluyas ...	2 3	Poor ..	Rusty	Medium early	6	Very weak straw
Huguenot ...	3 4	Very poor	„	Late ...	9	Coarse, straw semi-solid
Thew ...	2 6	Fair ...	Clean	Medium early	14	Fine straw, drill nice and even, by far the most promising under existing conditions
Crossbred, 28	2 3	„	„	Early ...	6	Rather disappointing, evidently more subject to dry conditions than others
Bunyip x Bunge 1B }	2 0	Poor...	„	... „	15	Yielded a good deal better than it looked; straw inclined to be coarse and spongy

DESTROYING STUMPS WITH ACIDS.

We have had numerous inquiries as to the efficacy of certain acids in the destruction of stumps, but in the absence of any reliable experiments, all we have been able to say on the subject has been unfavourable to the method, and Mr. J. C. Brünnich, Agricultural Chemist, has maintained that the process is not only useless but dangerous. We now publish the results of careful experiments made by the Department of

Agriculture of New South Wales, under Mr. H. C. Coggins, Assistant Inspector, which appeared in the "Agricultural Gazette" of that State for 3rd November last. From the following results, it may be conclusively affirmed that neither dry nor green stumps can be destroyed by the strongest acids.—[Ed. "Q. A. J."]

[In November last the Matcham Progress Association, of Matcham, *viz.* Gosford, suggested that the department should carry out a series of experiments in the use of acids for rotting out stumps, as a good deal of interest was being aroused on the subject, and various landholders were trying the process with not very satisfactory results. In consequence of this Mr. F. B. Guthrie, at the request of the Experiments Supervision Committee, designed the following series of experiments.—Ed. "Agricultural Gazette of New South Wales."]

There seems to have been some diversity of opinion as to whether dry and green stumps could be destroyed with acids, and with a view to determining the efficacy of this treatment, the department decided to experiment in this direction.

These experiments were carried out according to the following design, and included both dry and green stumps:—

1. Dry—1 pint sulphuric acid.
2. Dry—1 pint nitric acid.
3. Green— $\frac{1}{2}$ pint nitric acid, $\frac{1}{2}$ pint sulphuric acid.
4. Dry— $\frac{1}{4}$ pint nitric acid, $\frac{3}{4}$ pint sulphuric acid.
5. Green— $\frac{3}{4}$ pint nitric acid, $\frac{1}{4}$ pint sulphuric acid.
6. Dry— $\frac{1}{4}$ pint sulphuric acid, $\frac{1}{4}$ pint nitric acid.
7. Dry—1 pint nitric acid, 1 pint sulphuric acid.

The stumps treated were of the spotted gum, box, and ironbark variety, and were from 18 in. to 2 ft. 6 in. in diameter.

Holes were bored with a 2-in. auger in the stumps about 18 in. from the earth-line at an angle of 45 deg. to a depth of 18 in. Each stump was then dosed according to the design; the holes were then immediately plugged with green plugs.

Periodical notes were taken as to the action of the acids, and as six months have now elapsed, a sufficient time has been given to prove the experiment a success or otherwise.

It must be understood that the whole of these stumps were perfectly sound and solid, also that two out of the three varieties—viz., box and ironbark—are extremely hard wood, and if the acid would eat through these stumps then the majority of other timbers would be easy victims.

The final examination showed that, in the case of the dry stumps, in every instance the action of the acids had no appreciable effect, and beyond a very slight crumbling of the wood—in extent about 1 in. in the immediate vicinity of the hole no other effect was noticeable.

As regards the green stumps, in both instances the effect seemed to be slightly better. The wood in the immediate vicinity of the holes had rotted to a depth of about $2\frac{1}{2}$ in., but beyond that sound wood was found; in addition both stumps had thrown out vigorous suckers.

The above result clearly proves that sound stumps cannot be destroyed with either sulphuric or nitric acid or both, and these two acids are of the strongest known.

The experiment has an additional value, inasmuch as it has provided the actual cost per stump as against other methods.

The average cost per stump worked out at 1s. 9d., which includes cost of acids and labour paid at the rate of 7s. per day; and it is an open question whether men could be found to work with two such dangerous acids at that figure.

In the event of the success of the acids, the great drawback to clearing land by this method would be the vast amount of valuable time wasted in waiting for the stumps to rot away, irrespective of the danger of handling the acids, and when time is taken into consideration—and in every instance time is money—cheaper and quicker methods may be adopted.

Mr. C. W. Brown (Jilliby) in the "Gosford Times," recounts his experience in connection with the use of sulphuric and nitric acids for destroying stumps:—

"I thought I would have a try myself, as I have some heart-breaking stumps here, and as I take out everything in front of me, regardless of size, I thought that the acids would prove a great labour-saver. Having purchased 4 gallons of sulphuric and nitric acids (2 gallons each), I started operations on a green grey-gum stump 4 ft. high, and diameter 4 ft. 6 in. In that stump I bored three holes with a 2-in. auger, going the full depth of the auger, and in those holes I poured equal quantities of the acids, then plugged up with a green spotted gum plug, having previously put some in paraffin, which I had melted, and then also poured some of the paraffin over the plug to make certain that it was air-tight. I next tried a dead blackbutt stump, 10 ft. high and 4 ft. 9 in. across it on the top, the giant at the butt being 24 ft. 2 in. I bored four holes with the 2-in. auger, going its full depth, and repeated the same process as I did with the grey-gum stump. After waiting patiently for six weeks, I knocked out the plugs and refilled both stumps. From the time of refilling to the present day is five and a-half weeks, or in all eleven and a-half weeks, using in all $2\frac{3}{4}$ gallons of acids on the two stumps, and the only difference in them is what I pulled out with the auger. Having given the acids a first-class trial, I have to turn round again and use what I have been using for the last five and a-half years, gelignite, and it will be a hard job to find its superior."

I find throughout the State that farmers in several districts have started clearing by this method, and in every instance it has been discarded in favour of more reliable and quicker methods.

A NEW METHOD OF FERTILISING THE SOIL.

"The Implement and Machinery Review" (London) for 1st December, 1913, states that "an extraordinary discovery is said to have been made by the eminent Professor of Botany at King's College, London, Dr. W. B. Bottomley. As the result of seven years' experiment, it is said that the professor has found that by inoculating ordinary peat with nitrogen-fixing bacteria and using it as manure, he is able to increase the growth of plants and vegetables, in some cases as much as 150 per cent. When further experiments on a large scale are conducted next spring, particular attention is to be paid to the cultivation of wheat. Meanwhile, remarkable results have been obtained with other produce. The professor's further experiments will, we are sure, be awaited by the agricultural world with the greatest possible interest." This discovery recalls to our recollection the invention by Colonel Halford Thompson, F.R.H.S., of

JADOO FIBRE,

and its introduction into Victoria in 1897 by Mr. W. R. Virgoe, proprietor of the Old Chatsworth Nursery at Brighton, near Melbourne. This Jadoo fibre was a peaty moss, saturated with the fertilising liquid called Jadoo, from the Indian word meaning "magic," and when applied to plants either in the field or in pots, induces a wonderful growth of fibrous roots which enable the plant to absorb so much more nourishment that it grows quicker and stronger and healthier in every way than it can possibly do in soil alone. The same Jadoo may be used many times over; in fact, it has not yet been ascertained when it becomes exhausted.

Mr. Virgoe in 1899 published details of the process of manufacture, omitting, however, the exact proportions, although he was willing to furnish them.

THE FOUNDATION OF JADOO FIBRE

is absorbent peat moss.

In a large boiler, partly filled with water, the following ingredients are put in various proportions:—

Scot. Pink Gypsum, bonemeal, phosphoric acid, potash, nitrate of soda, sugar.

The boiler is then filled up with the peat moss in a dry state, and the whole is kept at boiling point for thirty minutes. The moss is then taken out and stacked. To it is added yeast, and the moss is fermented, and kept in that state, and at a certain temperature for a month or five weeks, when it is fit for use. The Jadoo liquid is made in the same way, but without the use of the peat moss.

In December, 1899, Mr. J. C. Brünnich, Agricultural Chemist, analysed the product, and wrote as follows on the result:

The Department of Agriculture supplied a quantity of Jadoo fibre to the Agricultural College for experimental purposes, and the results of these experiments will be looked for with interest, although in our rich College soils the effects might not be so marked as on poorer soil.

In order to see if what the inventor claims is really true, I made a complete analysis of the product, with the following results:—

I found Jadoo fibre to be a fine fibrous product, of brownish colour, which, almost like a sponge, has the power of absorbing an enormous quantity of water up to six to eight times its own weight. This fact alone will explain part of its practical value, when used for pot plants, in the orchard or vineyard. This fibrous raw material is saturated with plant foods, which, according to analysis, are to a large extent soluble in water, any plant having thus a fair amount of plant foods at once available for its growth; another portion of the plant foods are like some in the soil not soluble in water, but soluble in hydrochloric acid, and these will become available gradually, by the chemical dissolving action possessed by the roots of growing plants. As a matter of fact, Jadoo fibre must be considered a highly fertile artificial peaty soil.

Analysis.						Per cent.
Organic matters .. .. .. .. .. ..	..	..	..	..	..	71·40

Containing .812 per cent. of Nitrogen = .986 per cent. Ammonia.

Mineral matters—

Soluble in water (total, 4·36 per cent.)

	Per cent.
Phosphoric acid, P_2O_5 .. .. .. .. ..	.445
Sulphuric acid, SO_3	1·286
Nitric acid, N_2O_5 .. .. .. .. ..	.520
Alumina and iron, Al_2O_3 , Fe_2O_3 .. .. .. .. ..	.271
Lime, CaO .. .. .. .. ..	.303
Magnesia, MgO .. .. .. .. ..	.107
Potash, K_2O .. .. .. .. ..	.357
Soda, Na_2O .. .. .. .. ..	.750
Ammonia, NH_3 .. .. .. .. ..	.020

Soluble in hydrochloric acid, 1·1 sp. gr.

	Per cent.
Silica, SiO_2 .. .. .. .. ..	.031
Sulphuric acid, SO_3 .. .. .. .. ..	.926
Phosphoric acid, P_2O_5 .. .. .. .. ..	.715
Alumina, Al_2O_3 .. .. .. .. ..	.765
Iron, Fe_2O_3 .. .. .. .. ..	.170
Lime, CaO	1·875
Magnesia, MgO .. .. .. .. ..	.163
Potash, K_2O .. .. .. .. ..	.402
Soda, Na_2O .. .. .. .. ..	.791

Insoluble in HCl	5·838
..	4·012

Total ash	9·85
Moisture	18·75

The inventor does not claim the product to be a manure, and in accordance with the analysis the actual value of the plant foods,

phosphoric acid, potash, and nitrogen amounts to 15s. per ton of Jadoo fibre. The secret of the preparation lies in the foundation material, which has the power of absorbing and retaining the fertilising ingredients, which are thoroughly incorporated with the fibre by a slow process of fermentation.

I believe the manufacture of this product could be successfully started in this State, and I do not think that a better foundation material could be found than finely crushed megass from a sugar-mill. Megass by itself has only a very slight manurial value (about 6s. per ton), but megass possesses great absorptive power, and retains water just as well as Jadoo fibre, and, again, does not rot quickly in the ground. Perhaps finely chopped trash, or, again, dried filter press cake, might be added with advantage to the megass.

A FEW OBSERVATIONS ON THE RAISING OF WINTER FODDER CROPS.

By G. B. BROOKS, Instructor in Agriculture.

In the winter months it is interesting to note the great variation in the growth of winter fodder crops, more especially should the season have been at all a dry one.

On one farm one might see nice healthy-looking crops, while on those adjacent to it they are poor and stunted, even although grown on similar soil and under identical climatic conditions.

To the settler who has made no provision in the way of ensilage or dry fodder, a field of green material to draw upon in a dry time is, needless to state, of very great value, and the methods of the farmer who can raise a crop of such under adverse climatic conditions are worth looking into.

The reason, perhaps, why so little care is taken to ensure a full crop is, that given a dropping winter, one can, on an average Queensland soil, grow fair crops of fodder, even although practising the most careless methods of preparation. For instance, it is not at all an uncommon thing to see areas ploughed one day and seeded down the next. Should the winter be at all a dry one, however, the results are altogether different—good crops are then the exception rather than the rule.

Now, when we come to investigate the methods of the successful man, we find that it is not so much the kind of soil, or the manner in which he cultivates it, that ensures a crop, but the time or season when it is prepared.

Of course, one cannot get away from the fact that poor soil and careless cultivation are closely connected with light yields, but it is the farmer who puts his land into good tilth early in the season who invariably reaps a heavy crop.

Numerous examples bearing this out are to be met with in practically every district, examples which should be valuable object lessons to those whose efforts have resulted in failure.

Much has been written on the subject of dry farming and the wonderful results obtained thereby. To sum it up in a few words, the whole secret of dry farming lies in early preparation. No sooner is one crop taken off than the land is broken up either with the plough or disc cultivator for the next.

I firmly believe that by going over the land immediately after harvesting either a wheat, corn, or any other crop, it would be the means of going pretty near to doubling the yield.

Early cultivation, it may be mentioned, has a two-fold effect, viz., the conservation of moisture and the making available of the necessary plant food, two essentials in successful crop production.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF DECEMBER, 1913.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks
			Lb.	%	Lb.	
Madame Melba	Holstein ...	10 Nov., 1913	1,194	3·4	48·32	
Lady Loch...	Ayrshire ...	31 Aug. "	1,030	4·2	48·26	
Glen ...	Shorthorn...	27 Oct. "	1,041	4·0	46·52	
Bluebelle ...	Jersey ...	13 July "	677	4·4	33·43	
Butter ...	Shorthorn...	27 Sept. "	761	3·8	32·22	
Pauline ...	" ...	8 Oct. "	868	3·4	32·66	
Nellie IL ...	" ...	5 June "	714	3·8	32·22	
Miss Bell ...	Jersey ...	25 Sep. "	633	4·4	31·26	
Honeycombl e	Shorthorn...	7 June "	632	4·4	31·21	
Miss Edition	Jersey ...	19 July "	632	4·2	29·78	
Rosine ...	Ayrshire ...	27 Nov. "	763	3·5	29·60	
Auntie ...	" ...	15 July "	637	3·9	27·71	
Lennie ...	" ...	1 Sept. "	680	3·6	27·20	
Gem ...	Shorthorn...	8 Aug. "	621	3·8	26·29	
Bee ...	Jersey ...	7 July "	504	4·6	26·08	
Burton's Lady	Shorthorn ...	23 June "	631	3·6	25·24	
Daisy ...	Holstein ...	14 Feb. "	687	3·2	24·23	
Silver Nell ...	Shorthorn...	26 Sept. "	498	4·2	23·42	
Lavinia's Pride	Ayrshire ...	11 Dec. "	693	4·2	22·60	
Lonesome ...	" ...	26 Oct. "	599	3·4	22·53	
Sweet Meadows	Jersey ...	20 Aug. "	346	5·6	21·99	
Countess of Brunswick	Shorthorn...	22 July "	581	3·4	21·36	
Miss Melba	Holstein ...	22 Jan. "	559	3·5	21·69	
Cocoatina ...	Jersey ...	19 May "	420	4·5	21·24	

Fed on natural grasses, with an added ration of 40 lb. of sorghum ensilage per head per day.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, DECEMBER, 1913.

Very hot weather was experienced during the first half of the month, commencing on 3rd December. The highest reading was recorded on the 10th, when the maximum shade temperature was 114 deg. The laying fell off in consequence. By the free use of water, however, the deaths resulting from heat apoplexy were limited to two hens. The ideal weather conditions prevailing during the latter part of the month, resulted in an all-round improvement in laying. Five thousand two hundred and twenty-three eggs were laid. Moritz Bros. win the monthly prize.

The following are the individual records:—

Competitors.	Breed.	Nov.	Total.
J. R. Wilson	White Leghorns	130	1,203
A. H. Padman	Do.	138	1,200
Moritz Bros.	Do.	152	1,180
Loloma Poultry Farm, N.S.W.	Do.	140	1,171
T. Fanning	(No. 2)	140	1,166
O.K. Poultry Yards	Do.	124	1,149
Range Poultry Farm	Do.	140	1,137
T. D. England	Do.	134	1,104
E. A. Smith	(No. 2)	137	1,103
R. Burns	Black Orpingtons (No. 2)	144	1,093
J. F. Coates	White Leghorns	138	1,083
R. Burns	Black Orpingtons (No. 1)	137	1,071
J. Zahl	White Leghorns	140	1,067
S. E. Sharpe	Do.	119	1,062
H. Tappenden	Do.	121	1,058
A. T. Coomber	Do.	139	1,057
F. McCauley	Do.	113	1,057
Cowan Bros., N.S.W.	Do.	123	1,040
Jas. McKay	Do.	119	1,039
W. D. Bradburne	Do.	143	1,039
Doyle Bros., N.S.W.	Do.	130	1,039
Mrs. Munro	Do.	134	1,034
E. A. Smith	(No. 1)	140	1,033
Yangarella Poultry Farm	Do.	139	1,007
H. Hammill, N.S.W.	Do.	132	1,005
Mrs. Sprengel, N.S.W.	Do.	119	1,004
A. F. Camkin, N.S.W.	Do.	135	1,003
D. Grant	Do.	121	975
R. Jobbling, N.S.W.	Do.	115	974
J. Archibald, N.S.W.	Do.	130	965
T. Fanning	(No. 1)	135	955
J. Murchie	Brown Leghorns	138	953
C. Leach	White Leghorns	135	953
J. Gosley	Do.	120	946
Mrs. Craig	Do.	133	941
A. Schbrowski	Brown Leghorns	121	928
T. Stephens, N.S.W.	White Leghorns	119	908
Mrs. Beiber	Brown Leghorns	132	890
A. C. Collis, N.S.W.	White Leghorns	128	882
J. Andersen, Victoria	Red Sussex	105	862
Totals ...		5,223	41,336

MAIZE AND FOWLS.

It has been frequently pointed out to farmers and others who keep fowls in large or small numbers, that persistence in maize-feeding is injurious to fowls. But we still find on the farms, as well as in the suburbs and towns, that whole maize is fed to fowls every morning and evening. Why should we have to go abroad to learn the injury done to fowls by this constant maize-feeding, when a line to the Poultry Expert at the Q.A. College would set poultry breeders on the right track as to feeding? The " Fiji Planters' Journal " has the following article on the subject, and we would advise poultry keepers to read, mark, learn, and inwardly digest it. That journal says:—

Too much maize is not good for fowls, as it brings on liver disease sooner than anything we know. It makes too much internal fat, and also makes blood too fast. Fowls that are fed liberally on it get lined with yellow fat, especially in the abdomen. We have taken it out when it has been $\frac{1}{2}$ in. thick—the egg organs become so weak that the hens lay shell-less eggs. Even this is not the worst part of it, as fowls which have liver disease are susceptible of many other complaints, especially roup.

It is not always the liver that actually kills them—it is very often that other diseases follow through their being in a weak state. When roup has been incurable, we have found on examination that the liver was diseased, being full of tuberculous matter—it is commonly called serofula—having white spots on it. Sometimes these spots are only as large as the head of a pin. We have found also in a few instances tumors, which maize is very liable to bring on. In cases where only the ordinary serofula is coming on, tuberculosis substance forms in small yellow spots, about as large as a pin's head; these sometimes develop so quickly that they are $\frac{1}{4}$ in. through, and the liver more than three times the ordinary size. We have weighed it when it has been from 9 to 11 oz., while the ordinary weight should be from $2\frac{1}{2}$ to $3\frac{1}{4}$ oz.

Inbreeding also brings on liver disease, from which there are more fowls die than from all other diseases put together. We have known farmers use maize for years together, and it has effected the progeny so that they could scarcely rear a chicken. They die off when from four to seven days, and from three to six weeks old. It is used so largely simply because it is such a cheap food, and fowls seem to prefer it to any other grain. A little for a change does not hurt, especially in the cold weather.

We use more wheat than any other grain, as that is not so fattening as most other grains are. Next to wheat, we use good oats, which are a splendid grain for a change, but they ought not to weigh less than 40 lb. to the bushel. Hemp-seed is also an excellent grain for the breeding season, especially for the male birds. If this is given there will not be many unfertile eggs. It is also very good in the autumn through the moulting season, as it is stimulating. It is used largely for bringing young chickens into good condition for the show pen, but it is well to change the grain, as the birds like variation.

From October to March it is well to give corn softened by boiling from fifteen to twenty minutes, and standing the pot on one side till it soaks up the water used for boiling, giving it to the fowls when hot. Care should be taken not to boil the grain too much, or use too much water, as it causes it to burst and become sticky, in which state it is not at all liked by the fowls.

They ought not to have as much boiled corn as they can eat, but should have a little hard corn to finish up with. When meat is given to the fowls, it should be cut into small pieces just so that the fowls can swallow it easily. If given in too large pieces, one hen gets hold of a piece and runs away with it, and while she is trying to peck it to pieces, the others eat all theirs, and then have a good run to the large piece, in which case the hen which ran away with it usually gets none, and, worse than this, should she swallow the large piece she often gets into trouble, as it is apt to cause stoppage in the passage between the crop and gizzard. Where a large number of birds are kept it is well to pass the meat through a sausage machine.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1914.

Date.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4°56'	6°46'	5°21'	6°42'	5°41'	6°20'	5°57'	5°47'	4 Jan. ☽ First Quarter 11 9 p.m.
2	4°57'	6°46'	5°21'	6°42'	5°41'	6°19'	5°58'	5°46'	" " ☽ Full Moon 3 9 "
3	4°58'	6°46'	5°22'	6°41'	5°42'	6°18'	5°58'	5°45'	12 " " ☽ Last Quarter 10 30 a.m.
4	4°59'	6°46'	5°23'	6°41'	5°42'	6°17'	5°59'	5°43'	19 " " ☽ New Moon 4 34 p.m.
5	4°59'	6°46'	5°24'	6°40'	5°43'	6°16'	5°59'	5°42'	" " ☽ First Quarter 8 33 p.m.
6	5°00'	6°47'	5°24'	6°39'	5°44'	6°15'	6°0'	5°41'	11 " " ☽ Full Moon 3 35 a.m.
7	5°1'	6°47'	5°25'	6°39'	5°44'	6°14'	6°0'	5°40'	17 " " ☽ Last Quarter 7 23 p.m.
8	5°1'	6°47'	5°26'	6°38'	5°45'	6°13'	6°1'	5°39'	25 " " ☽ New Moon 10 2 a.m.
9	5°2'	6°47'	5°27'	6°37'	5°45'	6°12'	6°1'	5°38'	5 Mar. ☽ First Quarter 3 3 p.m.
10	5°3'	6°47'	5°28'	6°37'	5°46'	6°11'	6°2'	5°37'	12 " " ☽ Full Moon 2 18 "
11	5°4'	6°47'	5°28'	6°36'	5°46'	6°10'	6°2'	5°36'	19 " " ☽ Last Quarter 5 39 a.m.
12	5°4'	6°47'	5°29'	6°35'	5°47'	6°9'	6°3'	5°35'	27 " " ☽ New Moon 4 9 a.m.
13	5°5'	6°47'	5°30'	6°35'	5°47'	6°8'	6°4'	5°34'	" " ☽ First Quarter 5 52 "
14	5°6'	6°47'	5°31'	6°34'	5°48'	6°7'	6°4'	5°33'	10 Apr. ☽ Full Moon 11 28 p.m.
15	5°7'	6°47'	5°31'	6°33'	5°49'	6°6'	6°5'	5°31'	" " ☽ Last Quarter 1 12 a.m.
16	5°8'	6°47'	5°32'	6°32'	5°49'	6°4'	6°5'	5°30'	18 " " ☽ New Moon 4 22 p.m.
17	5°9'	6°47'	5°33'	6°31'	5°50'	6°3'	6°6'	5°29'	5 Mar. ☽ First Quarter 3 3 p.m.
18	5°9'	6°47'	5°33'	6°30'	5°50'	6°2'	6°6'	5°29'	12 " " ☽ Full Moon 2 18 "
19	5°10'	6°47'	5°34'	6°30'	5°51'	6°1'	6°7'	5°28'	19 " " ☽ Last Quarter 5 39 a.m.
20	5°11'	6°47'	5°35'	6°29'	5°51'	6°0'	6°7'	5°27'	27 " " ☽ New Moon 4 9 a.m.
21	5°12'	6°46'	5°35'	6°28'	5°52'	5°59'	6°8'	5°26'	" " ☽ First Quarter 5 52 "
22	5°13'	6°46'	5°36'	6°27'	5°52'	5°58'	6°8'	5°25'	10 Apr. ☽ Full Moon 11 28 p.m.
23	5°13'	6°46'	5°37'	6°26'	5°53'	5°57'	6°9'	5°24'	" " ☽ Last Quarter 1 12 a.m.
24	5°14'	6°45'	5°37'	6°25'	5°53'	5°56'	6°9'	5°23'	18 " " ☽ New Moon 4 22 p.m.
25	5°15'	6°45'	5°38'	6°24'	5°54'	5°54'	6°10'	5°22'	5 Mar. ☽ First Quarter 3 3 p.m.
26	5°16'	6°45'	5°39'	6°23'	5°54'	5°53'	6°10'	5°21'	12 " " ☽ Full Moon 2 18 "
27	5°16'	6°44'	5°39'	6°22'	5°55'	5°52'	6°11'	5°20'	19 " " ☽ Last Quarter 5 52 "
28	5°17'	6°44'	5°40'	6°21'	5°55'	5°51'	6°11'	5°19'	27 " " ☽ New Moon 4 9 a.m.
29	5°18'	6°43'	...	...	5°56'	5°50'	6°12'	5°18'	5 Mar. ☽ First Quarter 3 3 p.m.
30	5°19'	6°43'	...	...	5°56'	5°49'	6°12'	5°18'	12 " " ☽ Full Moon 2 18 "
31	5°20'	6°43'	...	...	5°57'	5°48'	...	...	19 " " ☽ Last Quarter 5 52 "

State Farms.

The manager of Bungeworgorai State Farm, Roma, reports as follows on the operations, &c., for December, 1913:—

Weather Conditions.—The dry conditions mentioned in November report have continued up to time of writing, 14th December. The effects of the excessive temperatures experienced during the heat wave on vegetation has been disastrous, more especially on the sandy soils, where the foliage in many instances bears the appearance of having been in proximity to a fire. During the last few days the weather has broken, storms having been experienced in the surrounding districts, and indications are favourable to more. Rain fell on two occasions, .02 points being recorded.

The following are the meteorological readings for the month ending 14th November, 1913:—

Humidity (lowest), 13 deg.; average, 29 deg.

Maximum, 112·5 deg.; average, 100·5 deg.

Minimum, 55·0 deg.; average, 62·4 deg.

Land Under Crop, Permanent: Vineyard.—The first of the table grapes were marketed on the 9th instant, the returns for which have not yet come to hand. Owing to the shortage of water, the birds have congregated on the ridge in large numbers, in consequence of which a large quantity of fruit is destroyed by the fruit-eating birds amongst them every day.

Orchard: Citrus Fruits.—The lemons mentioned as having been marketed in last month's report realised from 14s. 6d. to 16s. 9d. per case. The greater part of the balance of this crop is past benefiting from rain, and the trees themselves are beginning to show signs of being seriously affected. As a result of the excessive heat, the leaves not only curled but turned colour in the same manner as they would had they been scorched by fire.

Deciduous Fruits.—The returns from the apricots, of which 49 quarter-cases were marketed, have been received, and though not equal to those of last year, were as good as could be expected under existing circumstances. This class of tree (deciduous) is not exhibiting signs of lack of moisture to anything like the extent the citrus fruits are, due to the fact that in the winter less moisture is required by them owing to their being dormant, in consequence of which more moisture was held in reserve in the soil when the prevailing dry conditions began.

Temporary Crops (Summer).—The seed mentioned as having been sown in last month's report is still awaiting rain to promote germination.

In addition to this 2·75 acres of Japanese millet, 3 acres of maize, and 3 of sorghum have been put in for silage. The ploughing of another 7 acres for growing crops, the same purpose, is nearing completion, but the condition of the soil renders it extremely difficult to obtain anything like the desired tilth, and progress is naturally exceedingly slow.

Cowpeas.—A few drills of new crossbreds of this plant sown in the earlier part of the season on the sand are in most instances not only looking well, but still growing, which only serves to further illustrate the value of this crop to farmers in dry districts where extreme heat is likely to be experienced, which burns off most other kinds of vegetation.

Fodder Crops: Lucerne, 1 Acre.—The 6-in. high crop mentioned in previous report has been cut and fed to stock. The effects of continued dry conditions are more apparent on that portion situated on the lighter soil, where the plants are beginning to die out.

Rhodes Grass.—This grass is showing well under existing conditions, being still green. Its superiority over some of our native grasses is demonstrated by the fact that those found growing throughout the crop have died right back and become dormant, whilst odd plants of the Rhodes have gone so far as to produce flowering heads.

General.—The watering and mulching of the young fruit trees has been proceeded with, but a great number have been so injured by the heat owing to lack of foliage that they will not recover.

Posts have been secured for the fencing in of assistants' quarters and placed in position.

Both horses and cattle look exceptionally well. Artificial feeding will have to be resorted to in the course of a fortnight if rain is not experienced in the meantime.

The pigs have had a most trying time, but no losses have occurred to date.

Mr. D. Macpherson, manager of Kairi State Farm, reports:—

After a rather prolonged spell of dry weather, the rain set in in earnest on the 12th December, and between then and the end of the month we had twelve wet days, the total rainfall for that time being 779 points.

Forty-five acres of last season's falling has been planted with maize. This came up splendidly, but, unfortunately, wallabies and bandicoots have played havoc with it. In previous years these vermin have been satisfied to take a toll round the edge of each falling, but this year they have worked right out to the centre of the piece.

Small plots of cowpeas, six varieties, and various strong-growing beans have been planted, also white panicum.

Since the rain, lucerne has made and is making a most wonderful growth. I cut one lot for hay to-day that had practically nothing on it when the rains came, a little over three weeks ago, while another plot that is used for soiling makes marvellous growth behind the scythe.

From the State Nursery, Kamerunga, Cairns, the manager, Mr. C. E. Wood, writes:—

The long dry spell was broken on 12th December, when 40 points of rain fell. Between this date and end of the month, 13.59 in. were recorded. After the first showers, all ground lying in the rough was harrowed down, ploughed, again harrowed, and made ready for planting small plots of various seed.

Two or three rows (about 2 chains each) of the following legumes were planted for comparing growth as cover crops:—Mammoth cowpea, White's perennial cowpea, Iron cowpea, Groit cowpea, Chinese mottled cowpea, Mauritius beans, small Madagascar bean. There are all runners, while non-running legumes are: Poona cowpea (generally, I believe, considered an upright grower), Black and Yellow Pigeon pea (*Phaseolus Max* and *P. Mungo*).

In our climate, where weeds spring up so quickly, and rain is apt to be continuous, cover crops are an important item. The use of legumes as soil renovators cannot be over estimated, as by ploughing in, large quantities of humus are added to the soil, and the nitrogen "drawn from the atmosphere by means of bacteria for which the roots of the legumes act as hosts" must also be added.

Other seeds sown comprise Japan Upland rice, Raggee, white panicum, sorghum and sesamum. Although only three weeks have elapsed since the first rain, grasses such as Guinea and Red Natal are from 15 in. to 2 ft. high on patches of cultivated ground, and the surrounding country, which looked brown and bare, is now green with grass, burrs, and sida retusa.

Mr. A. E. Soutter, manager of the Roma State Farm, Bungeworgorai, appears from his report (12th January) to have had many difficulties to contend with owing to the dry weather of the latter part of last year, but the rains which have lately fallen will doubtless soon produce beneficial effects. It is noted that, despite the shortage of fodder crops, there has been no necessity for hand-feeding to stock, and the cattle have done remarkably well, as is evidenced by the sale of two fat cows to the local butcher early in January. Mr. Soutter's report is as follows:—

Weather Conditions. Notwithstanding that the dry spell mentioned as being experienced at time of submitting last report was partially dispelled on the 19th, 20th, 21st, 22nd, and 25th December -1.67 in. being recorded at the present moment vegetation is again evincing signs of distress. This is not to be wondered at considering how dry the subsoil must be and the excessive temperatures, accompanied by hot, strong winds, which have been experienced during the past week.

The following are the meteorological readings for the period under review:—

The maximum temperature recorded was 109°; average, 98.2°.

Minimum temperature recorded was 51°; average, 61.5°.

Humidity (minimum) 21°; average 49°.

Permanent Crops: Vineyard.—The excessive heat completely destroyed the crops of grapes on some of those varieties having sparse foliage—viz., Centennial, Golden Champion. The rain experienced rotted the “Chavneh.” This is always the case with this variety, and it is to be regretted, as it is a most wonderful grower and cropper with berries of extra large size, of good flavour. The Ferdinand de Lesseps also seemed to be affected by the conditions, as, though they were larger than in previous seasons, when ripening off seemed to wilt and turn sour.

The following have turned out well so far:—Chas. Violet, Chas. Negropont, Mad. Royal, Muscat, Hamburg, Royal Ascot, Muscat Beaume, Raisin de Dame.

Some of the late varieties are looking well. As previously mentioned, great numbers of birds migrated here during the excessive hot weather, and having remained, have wrought great havoc in the vineyard.

The lack of natural food and absence of water, due to droughty conditions, accounts for the increase of their numbers over those of other seasons.

Orchard.—The rain was not of sufficient quantity to be of much benefit to the citrus fruits, though it freshened up the trees wonderfully. It is sincerely hoped that more will be experienced within the course of a few days, as the oranges and mandarins have not yet gone too far, though it is feared the greater part of the lemon crop is beyond saving.

Figs.—The sun has completely destroyed the crop of this fruit, which on one tree was a particularly heavy one.

Summer Crops.—Those sown before the rain look as well as can be expected. They consist of 6 acres maize, 4 sorghum, 2.75 panicum.

Six acres of sorghum sown since the rain has been scorched off and will have to be resown.

An area of 25 acres has been worked up for cow-peas. The seeding of this should be completed by 14th instant.

Four acres of sandy soil were worked up and sown with Rhodes grass previous to the rain, and a good strike resulted, but it is feared the uncongenial weather, in conjunction with weeds, will put its extreme hardiness to too severe a test.

Seed was scattered over 6 acres of a grazing paddock, consisting of a very sandy soil, and the rain brought about a fair germination here also.

Last week a test was carried out in order to ascertain whether drilling in seed with manure would prove beneficial, and what seed should be put on to the acre. Three acres were devoted to this, the results of which will not be forthcoming until after rain is experienced. Small sowings of the following crops have been made, the resulting plants in most instances looking well at present, viz.:—China nut, Teff grass, soya beans (two varieties), cotton, pumpkins, etc.

Transplantings were made of some grasses from seed boxes out in to the open during the cloudy weather. The plants were those resulting from crossing Rhodes grass with one of our indigenous grasses (*Chloris*).

Some died as a result of the removal, the others were sheltered from the direct rays of the sun to preserve them, and it is pleasing to be able to record that of those which have eared one at least proves to be a combination or conjugate plant.

The plants resulting from the tobacco cross scorched off similarly to those in 1907.

Stock.—The spring in the pastures has been sufficient to delay the necessity for resorting to hand-feeding so far.

On the whole horses and cattle look exceptionally well; in fact, two fat cows were disposed of to the butcher last week.

Owing to the severity of the weather it has been found necessary to spell the horses for four hours during the heat of the day.

GINDIE.

The experience in respect of dry weather and its effects on crops during the last few months of 1913 was much the same at the Gindie State Farm as at others, and in the farming districts generally. The Manager, Mr. R. Jarrott, writing on 15th January, says:—

In common with other parts of our State, we have been experiencing a dry time, and the outlook was not very cheering. From June to well on in November our rainfall was 38 points; just enough to give some extra work while getting in the hay crop.

But notwithstanding the dry weather all the stock were in good condition, especially the horses and sheep; the latter were very fat. I am pleased to say that we had some rain this month, in December, which will enable us to plant maize and other seasonable crops, including Rhodes grass. Up to the present, we have not been successful in growing this. When the ground has been cracked the seed has been scattered about on the low parts of the paddock, in hopes that when rain came some of the seed would be covered and come up, but it failed to do so, and we have had no better results where it was sown on cultivated land. I am afraid it will not take to our heavy black soils very well. Weather permitting, we will try different methods of planting it. If it can be grown on the flats where the Daisy Burr has killed the native grasses, and also on some of the low brigalow country, it would be of vast benefit to the district.

CALENDAR FOR 1914.

We have received from Messrs. Traill Bros., process engravers, Brisbane, a very neat, artistic calendar for 1914, for which we tender our best thanks and good wishes for the New Year. The calendar, we are informed, is entirely a Brisbane production.

The Orchard.

CINCTURING FRUIT TREES.

RENMARK EXPERIMENTS.

Cincturing fruit trees to induce the setting of the fruit, as described and performed by Mr. C. Ross, Instructor in Fruit Culture in this State, is a modified form of ringbarking, and is effected by means of a special instrument. In the "Murray Pioneer" for 12th December we find the following interesting account of the process as adopted at Renmark, South Australia. The writer says:—

Oranges are said to be falling very badly this year in Renmark plantations, and that this is true of at least some orchards I have seen for myself. How true it may be of the settlement as a whole I have had no chance to judge. That it is not universally true is evidenced by the fact vouchéd for by the manager, Mr. C. H. Katekar, that the Fairview Orangery, which last year produced a record crop of fruit, is carrying an even larger crop this year.

In the case of this orchard of Mr. Rose's there are special influences at work which may, perhaps, be responsible for the fact that the trees are promising so large a crop at a time when in other orange groves so many trees have shed nearly all their fruit.

The special factor which is very probably influencing the Fairview trees—as it very probably influenced them last year—is the use of a wire girdle, twisted tightly round the tree trunks to assist the setting of the fruit. Mr. Katekar experimented with the girdling last year, and was not desirous of making the experiment known until its value had been clearly demonstrated. But the matter got about, as such things will, and Mr. Katekar, realising that a knowledge of at least the broad lines of his experiment had become pretty generally spread, has been good enough to supply me with a little more detailed information than was contained in the general report.

The practice followed has been to tie a piece of soft, No. 10, wire round the tree trunk in the spring—using heat, if necessary, to make the wire sufficiently soft and pliable—tapping it to make it follow closely the irregularities of the surface, and then twisting it tight. The wire girdle is left on until the setting of the fruit is assured—until after midsummer, in fact—and is then removed.

The effect, apparently, of this treatment at Fairview last year was the heaviest crop of navel oranges ever harvested in Renmark. And, so far as can be seen, the trees have taken no harm from the girdling. The marks left in the bark by the wire have practically disappeared, the trees to-day appear to be in perfect health, and they are carrying an even heavier crop than that of last year.

The idea of girdling fruit trees with wire is not a new one, but I do not remember hearing of its application to orange-trees before. Ten years or so ago I learned that a wire girdle was frequently used by

pear-growers of the Donecaster district, in Victoria, and with good results. But there is so great a difference between the respective natures of the bark of the pear and orange tree that one might well be apprehensive lest a constrictive treatment suitable for the pear should prove injurious to the orange. One is inclined to suppose that any constriction, if tight enough to serve its intended purpose, would be likely to damage the tree by bruising the wood. As noted, the trees at Fairview are at present showing no signs of injury from the treatment to which they have been subjected.

Two things I should suppose to be essential to secure successful results from the wire girdle. The girdle must be tight enough to press into the bark, and it must be left on until the long period during which orange-trees are liable to cast their fruit is past.

Last Friday I visited an orange grove—a very nice little plantation of some 4 acres of nine-year-old trees—in which wire girdles have been tried this year in imitation of Mr. Katekar's experiment. Every tree in the grove, I believe, had been girdled, but with no apparent result at all on the setting of the fruit, which has fallen very badly. On some of the trees, indeed, it is difficult to find a single orange left. The wires have already been removed, through fear of damage to the trees as the bark swells, but a cursory examination of the trunks showed that in many cases (and this was probably true of most trees) the wires had failed to make a complete girdle. In places the mark of the wire could be seen in the bark, but wherever there was a depression the wire had missed it, and the circuit was broken. One does not need to think very hard to realise that if a girdle is to be of any use it must be complete, just as the cincture on the currant must be made right round the stem to be effective.

CINCTURING EXPERIMENTS.

Though the practice of girdling the orange-tree is new in Renmark, the cincture was experimented with a good many years ago. And it was tried then in Mr. Rose's orangery. Mr. Rose's experiment took the form of removing a strip of bark from the circle of the trunk, leaving "bridges" of bark, so as not to make the experiment too drastic. Even with the "bridges," however, it was a long time before the strip healed, and the effect on the trees was judged to be too severe for the experiment to be repeated. In Mildura, however, at about the same time (some ten years back) a number of experiments were tried with the single cut, complete cincture on orange-trees. In some cases the trunk of the tree was operated on, and in other cases branches were selected for the experiment. In every case of the complete cincture which came under my notice good results were recorded. Heavier crops were obtained by this means, and the trees appeared to take no harm from the operation. But the practice has not, apparently, been continued.

Since writing the above, I have been reading some of my old notes and am reminded thereby that Mildura growers did not confine these experiments of tree cincturing to the orange. The results obtained varied considerably with the variety of tree. On the Adriatic fig-tree the

cincture was most successful; and Jordan Almond trees operated on responded well, so far as crop was concerned. But on the prune d'Agen the cincture produced no effect whatever, probably owing to failure to make provision for the cross fertilisation of the blossoms. In the case of the almond and prune, a certain amount of gumming was induced by the cincture, but the fig bark healed over the wound without any appreciable injury to the tree.

It is worth stating here that most of the Mildura cincturing experiments had their origin in a series of articles on "The Philosophy of Cincturing," which Mr. W. H. Harrison, M.A., of Renmark, contributed to the "Cultivator" in 1903. But the earliest recorded experiment of this class in Mildura was made some years before this date by Mr. Thomas Wilkinson (since deceased) on an Adriatic fig-tree. Following in Mr. Wilkinson's wake, Mr. Henshilwood (who had seven acres of these trees) employed the cincture to force young, but well-grown, Adriatic fig-trees into early bearing. To the subsequent history of these trees of Mr. Henshilwood's an element of romance—or tragedy—is attached. But we have carried the subject far enough for the present.

To this, Mr. C. Ross adds:—

"Referring to my remarks on cincturing fruit trees in my notes on citrus-growing in the last issue of the 'Q.A. Journal,' I may add that I have read the article with much interest. As a general rule, I prefer that the cincture should be performed in the head of the tree, for the reason that it is not so drastic as when the main stem is operated upon. The cincture is more successful than the wire girdle, as the latter cannot be complete on any limb that is not perfectly cylindrical. However diverse the method is performed I should like some of our growers to try it and to state with what result. The principle is to check the return or descending flow of sap without unduly retarding the upward stream."

DISEASES IN CITRUS FRUITS.

On this subject, Mr. C. Ross, Instructor in Fruit Culture, writes:— Since my article on "Diseases in Citrus Fruits" appeared in the "Agricultural Journal" of January, 1914, I have received a letter from Mr. Charles C. Brittlebank, of the Pathologists' Branch of the Agricultural Department of Victoria, in which he states that he has received true samples of "Exanthenia" from Queensland and New South Wales. An excellent description is given in the "Agricultural Journal" of Victoria, vol. x., p. 401.

It would be of great assistance to this department in the interests of fruitgrowers, if samples of diseases and pests generally were sent in to our own Pathological and Entomological Branch for investigation and record.

Where *n. sp.* occurs in the same article, after the words *Phoma omnivora* or *Ascochyta corticola*, it should be explained that Mr. McAlpine, Vegetable Pathologist of Victoria, named these fungi. (See "Fungus Diseases," by D. McAlpine, pp. 43, 53.)

Horticulture.

DAFFODILS.

In Southern Queensland, the *Narcissus* or Daffodil flourishes as well as it does in cooler climates, yet these beautiful flowers are rarely seen in suburban or country flower gardens. Their cultivation presents no greater difficulty than growing a patch of cabbages or onions. Of course they require a certain amount of care. The chief cause of failure is late planting, although last year we planted the bulbs over a month too late and yet had a fine show of blooms. Some may be planted as late as May or June without any appreciable falling off in quality or quantity of blossom, while there are others—the *Poeticus* section, for instance—that can hardly be planted too early. The best results are obtained from these by planting in March, or even in February. The depth at which the bulb should be planted is important. It will vary with the size of the bulb. A good old English rule is that all *narcissi* bulbs should be covered with soil once and a-half their own depth, measuring from the collar of the neck to the actual base.

The best soil for these bulbs is a nice soft, sandy loam, but they are not at all particular as to soil, and may be left alone for several years after planting. Some, indeed, like a rather deep and somewhat stiff soil, and if the position is one partially shaded from hot sunshine in spring, the flowers of some of the species retain their beauty for a much longer period than they would if exposed to all the light and sunshine possible. *Narcissi* are well adapted for planting by the sides of creeks and waterholes. They delight in root moisture, and in the early stages of growth there should be no lack of it. They are also suitable for naturalising in grassy plots, when they may remain for a long period, for it is neither necessary nor desirable to transplant the bulbs annually.

The bulbs must on no account be allowed to come in contact with crude manure or they will assuredly be injured. Should manure be necessary at the time of planting, owing to poorness of soil, it should be well rotted and placed at such a depth that the bulbs do not touch it, say, at least 6 in. below the bulb-planting level. As stated, plenty of water is required during the growing season, and the flowers will always be more beautiful in a moist season than in a dry one. When the soil is at last so exhausted that the plants show decided deterioration, the whole batch should be lifted, and it is an excellent plan to move the bulbs to an entirely different location, as a change of quarters makes a wonderful change for the better in their recuperative power. The lifting must be done with care, and the best time for the operation is when the foliage has attained the yellow stage preparatory to decay. Some place the bulbs in a cool, airy shed to dry, after which any offsets large enough may be separated from the parent plants, either by pulling them apart or cutting. Drying the bulbs indiscriminately is a very bad practice. As a general rule, lift, divide, and plant out at once. When planting

bulbs in grass plots, they may be dibbled in with a crowbar, or the grass may be taken up and the soil underneath prepared. The species and varieties are divided into sections, and these again into groups. The sections are: Hoop Petticoat daffodils, Trumpet daffodils, Chalice Crowned, and Poet's daffodils.

The groups are: 1. *Magni-coronati*. This group contains the largest Trumpet daffodils. 2. *Medii-coronati*, or Chalice-cupped daffodils (*Narcissus incomparabilis*). 3. *Parvi-coronati* (Dolly Cup or Small-crowned daffodils.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF DECEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING DECEMBER, 1912 AND 1913, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Dec.	No. of Years' Re- cords.	Dec., 1913.	Dec., 1912.		Dec.	No. of Years' Re- cords.	Dec., 1913.	Dec., 1912.
<i>North Coast.</i>									
Atherton	7.55	11	8.59	1.72	<i>South Coast--</i>		In. In.		In. In.
Cairns	7.71	25	10.76	1.71	continued:		3.69	25	3.01 1.29
Cardwell ...	9.18	25	7.41	0.69	Nanango ...		4.09	25	13.40 2.83
Cooktown ...	5.81	25	16.56	1.68	Rockhampton ...		5.51	25	3.67 4.83
Herberton ...	5.38	25	5.49	3.00	Woodford ...		6.97	19	5.22 ...
Ingham	6.40	20	7.51	1.50	Yandina ...				
Innisfail	13.02	25	7.46	1.53					
Mossman	11.55	5	19.92	1.90					
Townsville	5.68	23	6.72	1.38					
<i>Central Coast.</i>									
Ayr	3.57	25	9.18	0.14	<i>Darling Downs.</i>		In. In.		In. In.
Bowen	3.78	25	5.71	0.86	Dalby ...		3.36	22	1.35 1.18
Mackay	6.50	25	15.59	1.66	Emu Vale...		3.19	17	3.92 1.08
Proserpine ...	7.32	10	12.30	2.95	Jimbour ...		3.45	24	1.73 1.08
St. Lawrence ...	3.84	25	8.09	1.28	Miles ...		2.80	25	2.73 0.18
<i>South Coast.</i>									
Crohamhurst ...	6.86	20	4.45	8.24	<i>Stanthorpe</i> ...		3.51	22	1.57 3.41
Biggenden ...	5.11	14	4.81	1.09	Toowoomba ...		4.24	22	1.93 3.91
Bundaberg ...	4.57	25	5.22	1.61	Warwick ...		3.47	22	3.70 2.37
Brisbane ...	5.08	62	2.37	5.20					
Childers ...	5.69	17	3.77	2.72					
Esk	4.51	25	3.77	3.88					
Gayndah ...	3.45	25	5.78	5.06	<i>Maranoa.</i>				
Glasshouse M'tains ...	... ...	...	2.82	...					
Gympie	6.77	25	3.23	2.49	<i>Roma</i>		2.42	21	2.28 0.54
Kilkivan	4.31	25	4.65	3.04					
Maryborough ...	4.37	25	6.24	3.36					
<i>State Farms, &c.</i>									
Gatton College ...	3.18	14	2.83	3.97	<i>State Farms, &c.</i>				
Gindie	2.76	13	5.04	2.17					
Kamerunga Nurs'y ...	5.94	23	13.59	...					
Kairi ... ...	...	...	...	...	
Sugar Experiment ...	7.92	16	11.21	...					
Station, Mackay ...	...	...	...	...	
Bungeworgraorai ...	...	...	...	...	
Warren ... ...	...	...	...	...	
Hermitage	2.12	7	4.36	0.75					

NOTE.—The averages have been compiled from official data during the periods indicated, but the totals for December this year and for the same period of 1912, having been compiled from telegraphic reports, are subject to revision.

Tropical Industries.

QUEENSLAND'S RECORD SUGAR CROP.

The Government Statistician's estimate of the Queensland sugar crop for the year 1913, which may be taken as correct for purposes of comparison, shows a total yield of 241,496 tons, or some 30,000 tons in excess of the highest previous return.* One of the peculiarities which differentiate the sugar industry from most other field pursuits is that the lean year is often followed by one of exceptional productiveness, and *vice versa*. Thus, 1912 was the worst year experienced since the period of the great drought in 1902; and the year now closing has benefited through the amount of stand-over cane which in ordinary course would have been reaped in 1912. From this point of view, it will be interesting to compare the aggregate of the three-year period 1911-13 with 1908-10, culminating in what has hitherto been our record year for this crop. Thus, taking the estimate for the year now closing and adding it to the actual results for 1911 and 1912, we get a total of 527,852 tons for the three years. On the other hand, the aggregate returns for 1908-10 amounted to 496,438 tons. Thus, the estimate for 1913 shows an increase of 30,740 tons as compared with the yield for 1910; whilst the difference between the figures for the two triennial periods amounts to 31,414 tons in favour of the three years just closed.

The past season has been remarkable for the extreme dryness which characterised the latter half of the year. This, though favourable for harvesting, has meant a somewhat diminished growth of the cane: but on the other hand there has been no interference with the cutting and carting of the crop, and the density has not been lowered, as is sometimes the case, owing to excessive moisture. The extreme dryness has at the same time been a hindrance to the prospects of the 1914 crop: for it has stood in the way of planting, and the young plant cane and ratoons have not come away so well as they should have done under ordinary conditions. It is still early to speak of the outlook for 1914; but it was remarkable how well the crops withstand adversity; and with a continuance of the splendid weather of the past month, it may be anticipated that another successful year will reward the efforts of the farmer. Indeed, it is quite possible that in some of the districts where this year's cane yield has been light, the crop of the coming year will more than compensate for deficiencies.

Thus, the sugar grower has good cause for thankfulness whether he regards the past year or peers into the future. Things have certainly turned out far better than was at one time thought possible; and there has been far less trouble with labour than formerly. One hopeful sign,

* The estimate was published in the January issue of the "Queensland Agricultural Journal."—Ed.

as mentioned from time to time by several of our correspondents, is that a better class of men has been coming forward for engagement in cane-cutting; and though there is quite enough friction in some districts to cause the harvest season to be one of anxiety to the canegrower, there are indications that the industry is coming to be regarded as a stand-by for the unskilled labourer all over the Commonwealth, and especially for men who are desirous of making a "rise" for themselves and families, and who know the worth of money too well to fritter it away either in vexatious strikes or in purchasing still more harmful liquor. Apart from considerations as to the adequacy of the amount of the import duty, we believe the main hope for the continued success of the industry lies first in the skilful and energetic canegrower, who selects the best quality of land for his crop, uses the right description of fertiliser liberally, and sees to it that suitable varieties of cane are properly cultivated with the aid of the best machinery available. After this the sugar industry must depend on the intelligent labour of men willing to give a fair day's work for a fair day's pay—men who know very well that the farmer must get his bit out of it as well as the wage-earner, or the whole thing must go to pieces. The miller is, of course, a necessary element in the business; but we believe that so long as there is cane fit to crush there will, as a rule, be mills capable of doing justice to it, and in the great majority of instances the miller is far-sighted enough to know that a full and regular supply of suitable cane is of more consequence to the success of his enterprise than that he should be able to get cane—good, bad, or indifferent—at a price which cannot pay the grower. The year has been notable for the emancipation of the industry from oppressive Federal control through the medium of excise and so-called bounty; and we shall be surprised if either farmers or mill-owners are ever content again to place themselves in the same position, however difficult they may find it to settle differences which naturally arise between them.

These are the internal affairs of the industry, and should not be available as a handle to outsiders, either in interfering with the Customs protection afforded against black-grown sugar from other countries, or in seeking to impose new restraints upon grower or manufacturer. But let us glance at what the record harvest of 1913 means to the country at large. Let it be remembered that for the most part the sugar-cane which supplies this abundant return has been grown on land which but for this industry would in all probability be still covered with unproductive jungle; and it is harvested and handled by men who would otherwise be swelling the ranks of unskilled labour in Southern cities, already congested, because of the unwillingness of so many to seek work in the country, and make their homes there. We contend that if protection is a sacrifice that the people are justified in making in the interests of manufacture, it is doubly advisable in the cause of effective occupation of the soil, and settlement of our vast and fertile tropical areas.

A mere glance at the figures is sufficient to prove the strength of the position. It has been calculated that the sugar of the present season,

when refined, will produce, say 227,000 tons of sugar ready for consumption. The present price of A1 sugar is £21 15s. in Brisbane: £22 in Sydney, and £22 2s. 6d. in Melbourne. As by far the largest proportion of the sugar is consumed in the Southern States, the value may be averaged at £22 per ton, which works out at very nearly £5,000,000 for this year's crop. The greater part of this immense sum goes in wages, of one kind or another; and it has to be remembered that under present conditions, the canegrower is as a rule a "small man," so that the proceeds of the industry are more widely distributed and more evenly divided amongst the persons engaged in it than is usually the case with any manufacturing enterprise. From this point of view, and others which we have named, the sugar industry should appeal strongly to all who have regard to the general welfare of Australia: and they will heartily join with us in wishing to all our sugar producers, in every branch of the industry—A Happy and Prosperous New Year.—"Australian Sugar Journal."

NOTES ON DATE-GROWING.

A very interesting and instructive illustrated Bulletin on "Date Cultivation in the Punjab," Northern India, by D. Milne, Economic Botanist, Punjab, has lately been issued by the Agricultural Department of that district. We hope that, some day, Queensland farmers and orchardists will realise that as good dates as any in the world can be, and are being, produced, not only in our dry Western country, but also on the coast, and on the slopes of the Main Range. Why we should import dates when we can so easily grow them is among the many things one cannot understand. We might just as well cease growing pineapples, oranges, and mangoes, and import them from other countries.

We have frequently written in this journal on the subject of date cultivation, and at the risk of repeating ourselves we propose to extract from Mr. Milne's monograph such points as would be of value to anyone intending to plant date trees.

THE SOIL AND CLIMATE.

For the successful cultivation of dates, an extremely dry atmosphere, a very high temperature, and a plentiful supply of water are essential during the flowering and fruiting period. The Arabic saying, "the date palm likes its feet in the water and its head in fire" is roughly expressive of the requirements of the plant. The date palm appears to grow and produce fruit almost equally well on sandy, loamy, or clayey soils. The physical character of the soil appears to have little influence on the plant, except that the flowers and fruit may be a little earlier on sandy lands. The soils of the Saharan oases are mostly of a sandy nature; those of the Mesopotamian tract and in Egypt are mostly of very dense clays; while some of the date groves on the coast of Egypt are growing in almost pure sand. On the whole, sandy loams are best suited for date cultivation.*

* Such loams are the soils of large areas of the Central Western plains of Queensland, as at Barcaldine, Saltern, Longreach, &c. [Ed. Q.A.J.]

A plantation of young off-shoots is much more easily started on a sandy loam than on other soils, however, for reasons to be given later. Practically, any soil on which ordinary farm crops can be grown is suitable for the date palm. With regard to alkali soils, Mr. Milne, quoting W. T. Swingle of the U.S.A. Department of Agriculture, on the soils of the Algerian date palm tracts, says: "Although this plant can grow in soils containing 3 to 4 per cent. of their weights of alkali, it does not produce fruits unless its roots reach a stratum of soil where the alkali content is below 1 per cent., and does not yield regular and abundant crops unless there are layers in the soil with less than 0·6 per cent. of alkali."

The alkali referred to is a white alkali consisting chiefly of sulphates of sodium and magnesium, and a little of the chlorides of these metals. These soils also contain a great deal of sulphate of lime, which is believed to counteract the poisonous effects of the magnesium salts, and to prevent the formation of the very injurious black alkali. Swingle states: "If a soil at all depths contains 0·6 per cent. of alkali, the growth is slower, and the yield is less than on better lands, and where the alkali content is everywhere over 1 per cent., date palms do not bear fruit regularly, and their growth is very slow."

The adult date palm can withstand very large accumulations of alkali on the surface of the ground. The rise of alkali, so harmful to other crops, is often, therefore, not dangerously harmful to date palms. In laying out a young date plantation, however, the risk of the plants dying before becoming established will be greater if there is over 0·6 per cent. of alkali in the soil. It may not be convenient to have all soils analysed before starting a plantation, but, as wheat, corn, and lucerne crops, and peach, orange, prune, and other fruit trees are all believed to be unable to flourish in 0·6 per cent. of alkali, young date trees may be planted where one or other of the above can grow well. Barley, sorghum, sugar beets, and grape vines are believed to stand from 0·6 to 1 per cent. of alkali, but, unlike the date palms, these plants are easily killed by an accumulation of alkali at the surface of the soil. When dates are planted on lands containing alkali, and the trees obtain their water from a high water-table in the soil, and no irrigations are given to the land between the trees, either to crops, or for other reasons, a white crust of salt very soon forms on the surface of the soil. This is due to the fact that water is constantly depositing its load of salt as it is being evaporated from the surface of the land, and, as the evaporating current is always upwards, the salt deposit at the soil surface continues to be added to. In this way, a very large crust of salt may accumulate on the surface of the soil of a date plantation, even when the soil below the surface contains very little salt. . . . We often find date trees growing lustily in a soil, the surface of which is covered with a thick deposit of salt. The roots of the trees may, however, be feeding in a stratum from which practically all the salt has been removed and deposited on the surface of the soil, where it does not affect the trees. Very great damage may be done to such a plantation by very heavy rains,

or by flooding the land artificially. The reason of this is, that the salt deposit at the surface is dissolved, and a very strong solution of salt is carried down to the roots of the palms. The solution may quite easily be strong enough to be fatal even to vigorous, well-grown trees.

Effects of winds.—The date palm is not harmed by winds, even if they are of considerable violence, the roots of the palm being firmly fixed in the ground, its trunk strong and elastic, and its leaves very tough. It is indeed recorded that, in some cases in northern latitudes, the date trees fail to produce a crop if hot winds do not blow frequently.

Temperature.—Well-established palms do not appear to suffer from excessive heat or excessive dryness of the air if the roots have a sufficient supply of water. Date trees have been reported to stand as low a temperature as 20 deg. Fahr. in winter without harm, but where the temperature is low in the fruiting season the fruits will not ripen properly. Certain varieties of dates ripen at lower temperatures than others, and those varieties that ripen only in the hotter climates generally appear to be superior in quality to those that ripen in cooler climates. In most parts of the world, the fruits begin to form about 1st May. If the climate is hot, and the variety of date is one that requires comparatively little heat to ripen it, the fruit may be ripe in July, while, if the climate is cooler, or the variety be one that requires more heat to ripen it, the fruits may ripen as late as October. Various writers conclude that (*a*) the date palm can be grown but will not form flowers and fruits if the mean temperature between 1st May and 31st October is under 64 deg. Fahr.; (*b*) if the mean temperature between 1st May and 31st October is above 70 deg. Fahr., and is above 80 deg. Fahr. for one month at least, early varieties of dates will ripen fruits; (*c*) for moderately late varieties, these temperatures must be 75 deg. Fahr. and 85 deg. Fahr. respectively; (*d*) for some of the best and latest varieties these temperatures must be 84 deg. Fahr. and 94 deg. Fahr. . . . The amount of heat necessary to ripen the fruits of the date palm has generally been calculated by adding together the daily mean temperatures during the months when the dates are developing, the developing period being considered as extending from 1st May to 31st October. . . . Swingle states: "From three years' observations it is considered that about 3,600 deg. Fahr. are required to ripen the Deglet Noor date satisfactorily." The Deglet Noor date is supposed to be the finest date known, and the most difficult to ripen. In Ayata, Algeria, with an accumulated temperature of 3,764 deg. Fahr., Deglet Noor dates ripened well in 1889, and at Bagdad, Mesopotamia, the average of five years' observations showed that excellent varieties ripened with a mean accumulated temperature for the six months of 4,242 deg. Fahr. . . . No amount of heat has been found too much for date trees when properly cultivated.

Rainfall and Humidity.—In order that the date palm may produce abundant fruit of the best quality, it is essential that the air be very dry from the time the flowers open to the time the fruits ripen. Rain or a

damp atmosphere at other times of the year may be beneficial. The presence of water vapour in the air has been considered to cause harm to the date palm in the fruiting season by absorbing the heat from the sun's rays, and thereby preventing the temperature from rising to the great height necessary to develop and ripen the fruits properly. Damp or rainy weather is also injurious directly in preventing the fertilisation of the flowers in spring and in causing decay or dropping off of the fruit when it is developing and ripening in summer.

Swingle's Bulletin No. 53, United States Department of Agriculture, the Egyptian Survey Department's Almanac for 1906, and Fletcher's "Note on Date-palm Cultivation in Countries other than India" are collated by Mr. Milne in the following table:—

HUMIDITY AND RAINFALL.

Locality.	Mean relative humidity during flowering and fruiting season, 1st April to 30th September.		Average rainfall in inches per annum.	Remarks.
	Per cent.			
Biskra, Algeria	30		9·46	Of this amount 4·71 inches fell between 1st April and 30th November
Ayata, Algeria ... ...	...		4·89	
Phœnix, Arizona	33		7·08	Of this amount 3·82 inches fell between 1st April and 30th November
Alexandria, Lower Egypt	66·7		8·00	
Cairo, Egypt	53·86		1·08	
Berber, Upper Egypt ...	22		...	
Bagdad ... ...	...		4·8	

[TO BE CONTINUED.]

VALUABLE WHEATS.

We have been shown a letter addressed to Mr. Thos. Wood, nurseryman, George street, by Frederico C. Varela, Teneriffe, Canary Islands, describing two varieties of wheat, one of which, the writer says, gives a yield of 400 per cent. (without exaggeration), and the other one gives twice over the ordinary crop, but it has the great advantage, according to Mr. Varela, of thriving where no other cereal would live, because it accommodates its life to the worst kind of wasted (worn out?) soils, and further, with only one rain, it assures a crop in any case. An illustration of these wheats with an affidavit by a Notary Public, *viséed* by the British Consul and other Consulates, will be forwarded to Mr. Wood shortly. If these wheats on trial in Queensland should turn out to be what is claimed for them, a dry season should not be much to be dreaded by the wheat-grower.

Entomology.

SHEEP MAGGOT FLY PEST.

In October last, the Chief Veterinary Surgeon, Mr. A. H. Cory, M.R.C.V.S., and Mr. E. Jarvis, assistant Government Entomologist, were deputed by the Minister for Agriculture and Stock to proceed to the western districts, where the blow fly had become a serious menace to sheepowners, to investigate and report upon the results of their mission. Accordingly the two following reports were furnished by those gentlemen on their return to Brisbane:—

REPORT OF THE CHIEF VETERINARY SURGEON.

BLOW FLIES AND SHEEP.

I have the honour to submit the following report re the Blow Fly Pest affecting sheep in the Central District:—

Mr. Jarvis, assistant Entomologist, is reporting from an entomological point of view, therefore, my remarks will not embrace that portion of the subject.

Various sheep stations were visited by us in the Longreach, Emerald, Springsure, and Capella districts, and information obtained from some forty sheepowners, who are responsible for over 1,000,000 sheep.

With a few exceptions, the flies have not caused any serious trouble to sheep until the last two or three years. On one station near Springsure, and two stations in the Capella district, sheep have been more or less affected, according to the seasons, for the past ten years, and one gentleman informed me that he had seen sheep fly-blown in the Jericho district thirty years ago. Rams and other animals with wounds caused through fighting or other mechanical injuries, have always been blown unless attended to.

The worst months of the year, when the flies are most active, appear to be March, April, and May, but this year cases have been known where the flies have worked continuously since February. The activity of the fly is greatly controlled by climatic conditions. After rain a great number of sheep are attacked, the moisture assisting the development of the intermediate stages of the flies, also the spring of new grass which follows acts as a laxative on the sheep when soiling of the wool occurs—which is an attraction to the flies—thus the pest varies in different districts from time to time according to the weather.

The Blow Fly Pest is far more prevalent on the open downs country than in timbered country, which is contrary to the usual idea. Flies prefer a certain amount of shelter, from which they emerge to attack sheep as they pass. Owing to the number of good seasons we have experienced, there has been an over-abundance of grass; at the time of our visit there had not been any rain for about three months, but

green feed was plentiful everywhere. In my opinion, the good seasons referred to are largely the cause of the blow-fly pest increasing to such an extent in the open country, where there are innumerable grass tussocks, which provide the necessary shelter for the flies. If these grass tussocks are disturbed at or soon after sunset, hundreds of flies will be found sheltering around them. On the so-called desert country (within about 50 miles radius of Jericho) there is little or no loss, so far, from the flies.

From statistics obtained of the 1,000,000 sheep in question, an average of about 23 per cent. were attacked by the flies last year. Five stations had from 40 per cent. to 70 per cent. affected, the remaining thirty-five stations averaging just over 13 per cent. The flies have become so aggressive that not only are the ewes attacked, but quite a large number of weaners and wethers, in some cases up to 10 per cent. In the case of weaners, one must always remember that worms may be the exciting cause, by producing diarrhoea, which attracts the flies. If such is found to be the case, the cause must be removed. It is recognised by all practical sheep-men that the lighter-woolléd and plainer-bodied sheep suffer much less than those with heavy-yolked, dense fleeces and wrinkled bodies; but as sheep are kept chiefly from a wool-producing point of view, it is not expected that the old varieties of crossbreds will again become popular. With the present day improved type of merino sheep, wool is grown from practically every portion of the sheep; a denser wool with a greater amount of grease, which is moister, more easily soiled, and far more attractive to the blow flies.

Nothing new was noticed as regards the symptoms exhibited by affected sheep. The usual place attacked is the base of the tail or hips, but any part may be "fly-blown" if it has become wet or soiled by lying in manure, by some micturating upon others when lying down, or by heavy showers, &c. They are readily noticed by their dull appearance; they leave the flock and mope about by themselves. The wool on the affected part appears ragged or "tuffy," and the sheep shows a disposition to bite or rub itself, with a constant wriggling of the tail (if long enough). When examined, the wool over the diseased part is dark and moist, somewhat in a matted condition, at the base of which is noticed an abundance of maggots of various sizes, and, in cases further advanced, large open sores are found, or subcutaneous cavities practically seething with maggots. The sheep is in great distress, condition is rapidly lost, and the animal dies unless soon relieved of the maggots. The rectum and vagina may also be the seat of maggots. When these parts are affected, prompt and thorough treatment is required. Antiseptics such as corrosive sublimate 1 in 1,000, or lysol 2 per cent., injected by means of a syringe, give satisfactory results.

Frequent inspection of sheep is imperative, because one is impressed, when examining sheep, with the rapidity with which maggots develop. Sheep may be inspected to-day and found apparently sound; in two days' time the same sheep may be examined and found badly blown.

The customary treatment of affected sheep is to shear the wool from the blown area, taking care also to remove the wool for some inches beyond the area, the latter point being very important as the maggots have generally extended beyond the area first noticed. After this has been done, the part is dressed with probably one or other of the following medicaments:—

1. Kerosene and fat.
2. Tar, turpentine, and castor oil.
3. Cooper's powder or fluid dip.
4. Castor oil, tar, and iodoform.
5. Mallison's dip.
6. Turpentine and oil.
7. Sulphur and spirit mixed with fish oil.
8. Little's dip.
9. Quibell's dip.
10. Tar and kerosene.
11. Copper sulphate solution.

The above dressings were used by persons interviewed, but undoubtedly many others have also been tried with more or less success.

Tar dressings injure the wool, and, as the tar dries and the wool grows, it forms a crust, under which maggots are often found. Turpentine is very good, but it is too severe if used alone or on too large a surface; mixed with oil it is much safer.

From evidence obtained, copper sulphate, $\frac{1}{2}$ lb. to 1 gallon of water, appears to give the best results, but it is not without its bad effects. It stains and more or less injures the wool, so it can only be used after crutching, or for dressing fly-blown sheep.

In one case, 125 rams were examined weekly, and, on an average, nine to twenty-five were found fly blown on each inspection, when various dressings were tried. Copper sulphate solution was then tried, and only four rams were found affected in four weeks. The affected sheep are usually dressed in the yards, and I would here point out that sufficient care is not taken to destroy the affected wool and maggots, which should be done by burning or by saturating with a strong solution of arsenic. The same thing applies to hides and other decomposing matter around the yards, consequently the latter become prolific fly-breeding establishments, where the sheep are quickly fly-struck when they are yarded.

I would draw attention to the dangerous practice of using any arsenical solution on wounds, as it is readily absorbed. In several cases I found that practically pure arsenical dip mixture had been used to destroy the maggots, and it not only destroyed the maggots but the sheep also. Even when wounds are not present, arsenical preparations should always be mixed with accuracy, carefully following the directions accompanying the preparation.

Comparatively little has been done from a preventive point of view, although at the present time it must be admitted that little is

known on this point. Crutching has been adopted by a good many sheep-owners, and, where it has been thoroughly done (viz., by shearing at least 4 in. on either side of the vagina, extending to about 1 or 2 in. above the root of the tail and down below the hocks), with considerable success. The copper sulphate solution appears the best dressing to apply after crutching, although arsenical dressings have been found beneficial, the chief objection being that there is not sufficient wool left to retain the dip ingredients. The best time for crutching appears to be when the sheep have about six months' wool on.

In the course of our investigations, only seven stations were found which adopted dipping, and I consider the following remarks indicate the good results obtained:—

- No. 1.—Dipped 1,000 maiden ewes (hindquarters only) in Cooper's powder dip—no crutching; only twelve ewes fly-blown in six months.
- No. 2.—Dipped in June, and up to present date (13th October) not 2 per cent. fly-blown. When struck, the maggots did not develop and spread as with non-dipped sheep. Last year 80 per cent. of sheep struck.
- No. 3.—Dipped in May; very satisfactory results since; 40 per cent. of sheep were fly-blown last year.
- No. 4.—Dipped hindquarters of ewes in Cooper's five weeks ago; none fly-blown since; those not dipped have been blown. Marked 1,000 lambs in May, sprayed with Cooper's. Only about 1 per cent. blown since, and lesions did not extend.
- No. 5.—Dipped last four years, when six or eight weeks off shears; particulars not available.
- No. 6.—Dipped sheep in May. So far very satisfactory.
- No. 7.—Dipped sheep three months off shears in Royal dip; 10 per cent. affected last year. No flies at present.

Mr. L. P. O'Brien, of Capella, informed us that he erected a shower dip, 12 ft. by 6 ft., capable of holding fifty sheep. Its total cost, including pump, tanks, &c., was less than £8. Three thousand mixed sheep were dipped in June, two months off shears, and up to the time of our visit (13th October) not 2 per cent. had been fly-blown, and it was found that when blown the maggots did not extend as with undipped sheep. Mr. O'Brien had 600 undipped wethers running with these dipped sheep, and he stated that they were continually getting fly-blown. Last year 80 per cent. of Mr. O'Brien's sheep were affected. In this case Cooper's powder dip was used, the cost of which worked out at a fraction over ½d. per head.

Dipping, properly carried out in a poisonous solution, undoubtedly minimises the action of blow flies. A precipitate of arsenic and sulphur is left in the fleece for some months, which not only destroys or checks the development of ticks, larvae of blow flies, and lice, the latter being more prevalent amongst sheep than is generally believed, but the ingredients are well-known skin stimulants, which improve the growth and quality of the wool.

Mr. W. G. Brown, Sheep and Wool Expert, Queensland, wrote a most instructive article on "Shower Dipping," which appeared in the issue of the "Agricultural Journal" for January last, which I here quote:—

"In the course of my duties during the past twelve months, I have seen more lice and tick-infested sheep on the Downs than I believed possible, when so much advice on the advantages of dipping sheep has poured from the Press, from wool-brokers, and from practical sheepmen all over the States.

"I found that on every well-managed holding the dip was considered an essential part of the working plant, but in the case of smaller holders a large number had no dip, and, among the few who possessed one, carelessness in its use was common. At the risk, therefore, of seeming tedious I propose to show again the certain advantage of dipping in a proper manner, and further describe a method which eliminates any disadvantages of the process as it is too often conducted.

"Stated shortly, the advantages of dipping are:—

1st.—The destruction of ticks, lice, and other vermin which sheep on the Downs or coastal districts are so liable to carry. Ticks are easily noticed, but lice may exist on sheep without the owner being aware of the fact, for the insects are of the same colour as yolk, and very minute. These set up an irritation which causes the animal to rub against fence posts, stumps, and logs. One consequence is a badly-grown, felted, and ragged and generally inferior fleece.

2nd.—The worry causes a falling off in condition. A ticky or lousy ewe, owing to her condition, breeds a less robust lamb than if she were comfortable. The lamb itself becomes badly infested, and, if not dipped, will probably die of poverty.

3rd.—If dipping does not altogether prevent the attack of the maggot-fly, it certainly acts in no small measure against that pest. That fact, from evidence which I have at command, is undoubted, and, for that reason alone, all sheepowners should be compelled by law to dip their sheep, as they are in Victoria and Tasmania. Once a man dips his sheep, he will not require to be compelled, the benefits being so apparent.

"Summed up, therefore, the effects of dipping are—1. A better and more valuable fleece. 2. A more contented and, therefore, better 'doing' sheep. 3. A better and more robust lamb. 4. A fairly large degree of immunity from the attack of the maggot-fly.

"The disadvantages of dipping are—

Initial cost of dip and expense of working it.

Liability of injury to sheep, caused by rough usage, which is nearly unavoidable in ill-constructed dips.

The liability to serious loss after dipping by sudden falls in temperature or other changes of weather.

The liability of the animals swallowing a large quantity of the liquid in the bath, which, if it do not kill, will certainly make very sick sheep.

" The direct benefits of an increased price for a heavier fleece more than balance the cost of the operation. A sheep may be dipped for three-farthings or less, and at least one penny per pound will be added to the value of its fleece.

" As to liability of injury, I shall show below that a new method of dipping has been invented which eliminates all the sources of rough usage, and, further, makes it impossible for a sheep to be poisoned or drowned.

" Care in choosing suitable weather will prevent the losses caused by sudden changes of temperature. A sheep should be dipped as early as possible in the day, so that it may have its wool dry before night.

" The above short *résumé* of the principal effects of dipping sheep is given *apropos* of a method of operation which is radically different to the old plunge bath, and superior to it in every way.

" I met Mr. George Watson, of Tandawanna, some weeks ago, and he told me that for three years he had tried a new and superior method of dipping his sheep. He invited me to inspect his operations, and, a little later, telegraphed me that he was about to dip about 40,000 sheep and invited me to Tandawanna. What I saw I shall describe for the benefit of all sheep-men. I believe the method to be the best and most satisfactory in all respects of any.

" He informed me that he got the original idea from Mr. Charles Keane, of Gurley, New South Wales, but that he has improved on it in many respects since he first used it three years ago. I give below all particulars.

" The idea may be described as a shower bath instead of a plunge, and the essentials are a flat tray roof perforated with holes under which sheep stand quietly while the liquid used is showered upon them. The complete specifications of Mr. Watson's dip are as follows:—

" The shed is 40 feet long by 12 feet 6 inches wide. The roof is flat and covered with No. 22 gauge, flat galvanised iron, soldered at all seams, and perforated with No. 10 holes 3 inches apart. The iron is turned up all around the edge about 6 inches. Thus the roof is really a big iron tray. Roof joists are 6 inches by 2 inches, and placed 18 inches apart, and run across the building. The height of the shower is about 6 feet above the floor. The floor is of corrugated galvanised iron, No. 22 gauge, and not battened. The sheep have not injured it in any way in three years' working. The floor is laid with a fall to the side of 2 inches in 10 feet across the shed. The channels of the corrugation lead into a gutter, which carries the liquor draining off the sheep back into the dip tank where the dip liquor is mixed. The dip tank is an excavation 8 feet by 4 feet by 4 feet, lined with flat galvanised iron and made watertight. From this tank a 3-inch centrifugal pump, worked from a 3½-h.p. oil engine, delivers the dip mixture on to the tray roof of the shed, and this

falls in a gentle penetrating shower on the sheep standing beneath. A pair of gates at each end of the shed hold the sheep.

"In practice, when the entrance gates are opened, the sheep march straight through to the far end of the shed without the least trouble. Such a thing as 'dip-shyness' is not seen, and they are thoroughly wetted all over in six or seven minutes. I inspected a number of animals, and found that the dip was all over the body in every case. Three or four minutes suffice to drain them; thus a shedful of sheep may be dipped every fifteen minutes, allowing for filling and emptying. The capacity of the Tandawanna shed is from 250 to 300 sheep. One thousand sheep per hour can be dipped without undue haste by four men.

"An excellent feature of the shower dip is its extreme simplicity and small cost of construction. It may be built to work flocks of hundreds of thousands, or small flocks of 1,000 or under. For the small holding, a shed which will wet forty or fifty sheep at a time should not cost more than £10, and a cheap 2-inch Douglas hand pump would be quite effective. Better still, a No. 8 semi-rotary pump could be used, and should give excellent results. This pattern of dip is as good for the small holder as the great.

DRAININGS.

"Mr. Watson informs me that the sheep should be packed in pretty tightly. They cannot then hump their backs, and so prevent the dip getting under them as soon as it ought. After the sheep have drained four or five minutes the surface of the dip tank should be skimmed with a hand skimmer. This will keep the solution fairly clean. A minor source of trouble is the presence of short fribs of wool, which find their way into the dip tank, and from there into the shower. These fribs get into the perforations, but are easily removed by a boy using a broom over the surface of the tray.

"I have gone into this matter at some length, as I consider that there is no other way to dip sheep that approaches the Tandawanna shower-dip. Mr. Watson should receive the thanks of every sheep-master in the Commonwealth for elaborating a simple, cheap, safe, and effective method of dipping sheep. He informs me that the cost works out for dipping at about ½d. per head.

"I shall be pleased to answer any questions on the subject, and give any details which I may have missed above."

Another subject which was inquired into was, whether sheep with tails 3 to 4 in. long are less liable to be fly-blown than those with so-called "stump tails," or with extra long tails.

The evidence obtained was somewhat conflicting, but, after careful consideration, one must conclude that medium tails (3 to 4 in.) are beneficial for the following reasons:—

1. The movement of the tail frightens many flies away when about to attack sheep.

2. If the tail is of sufficient length when depressed, it keeps the wool on the sides of the anus and vagina more or less flattened and less liable to soiling.
3. By leaving the tail long enough to cover the vagina, it is a great protection, when shearing ewes, against injury to the lower commissure of the vagina. In shearing short or stumpy tailed ewes, the lower portion of the vagina (commonly called spout) is frequently cut or injured, consequently when the ewe micturates, the flow of urine is not thrown off in the usual way, but is spread, thus soiling the wool of the hind-quarters, which is attractive to flies.

Shearing is carried on in Queensland practically during the whole year, but as contract shearing is largely in vogue, it is necessary for each one to take their turn, therefore all cannot shear at the same time. Personally, from evidence obtained, I am in favour of Spring shearing, as it avoids a full fleece in the hottest weather, and in the wet season, and thus mitigates the action of blow flies.

I would suggest that experiments be carried out at the Gindie State Farm during the next twelve months, to ascertain the best preventive measures against the blow-fly pest. It will be necessary to erect, as soon as possible, a shower dip capable of holding 50 or 100 sheep, also to purchase from time to time sheep carrying wool of different ages. The experiments will not necessarily injure the sheep, therefore they can probably be sold again without any great monetary loss.

SUMMARY.

Until some method of destroying blow flies is found, I would strongly recommend the following points to sheepowners, viz.:—

1. Careful and frequent inspection of all sheep.
2. Total destruction of wool and carcasses containing the larva or maggots of blow flies by burning, or saturating with a strong solution of arsenic.
3. Shower dipping of sheep, with two months' wool, in an arsenical dip.
4. Thorough crutching when sheep have six or seven months' wool, and swabbing or dipping hindquarters in a solution of copper sulphate.
5. Isolate and dress thoroughly all fly-blown sheep until completely recovered.
6. During the fly season, place sheep (if possible) where there is short grass devoid of grass tussocks, and other shelter for flies.
7. Do not use arsenical preparations on wounds, and in every case when used, mix according to directions.

It has been suggested that compulsory dipping would be beneficial to all, but, before advising such action, I would recommend that the subject be submitted to the United Pastoralists' Association for an opinion.

Botany.

CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By F. MANSON BAILEY, C.M.G., F.L.S., Colonial Botanist.

Order AMARYLLIDEÆ.

CRINUM, Linn.

C. intermedium, *Bail.* n. sp. (Plate 14). Bulb 2-3 in. diam., forming no stem above ground. Leaves tapering to a rather blunt point. Longitudinal nerves numerous, the horizontal veins forming a faint tessellation. Scapes compressed, glaucous, with a reddish tinge towards the base. Bracts large, bracteoles slender. Perianth segments with apiculate yellow tips. The attached plate shows natural size of leaf and inflorescence of plant examined.

Hab. : Wai Weir Island, *E. W. Bick* (May, 1911).

The name is suggested by its close resemblance in some features to *C. Douglasii*, *Bail.*, and in others to *C. brevistylum*, *Bail.*, but differing sufficiently from both to entitle it to specific rank. Bulbs of the plant were brought to the Director of the Brisbane Botanic Gardens from Wai Weir Island in June, 1911, and have since only been grown in rather small pots, hence the plants now flowering show but a small growth.

Order AROIDEÆ.

AMORPHOPHALLUS, Blume.

A. campanulatus, *Blume*, forma **darnleyensis**, *Bail.*, n. form. (Plates 15, 16). To this Torres Strait Island plant is added the name of the island upon which it was met with, for although plants of the species have been recorded from islands off German New Guinea, I have neither specimens nor descriptions of the Papuan plant. The normal species has a very wide range, but has not, I believe, previously been found in Australia. The tuber which has recently flowered in Brisbane Botanic Gardens has only had an 8-in. pot to grow in so has not had a fair chance to develop itself, but Mr. Bick says that some of the plants on the island were over 5 ft. high, and had very large tubers, which were used by the natives for food. The stalks were clothed with short prickles.

Hab. : Darnley Island, Torres Strait, *E. W. Bick* (May, 1911)

PLATE 14.—*CRINUM INTERMEDIUM*, *Bail*, *n. sp.*



PLATE 15.—*AMORPHOPHALLUS CAMPANULATUS*, Blume, *forma DARNLEYENSIS*.
Bail. n. form.

(Specimen grown in an 8-in. pot.)

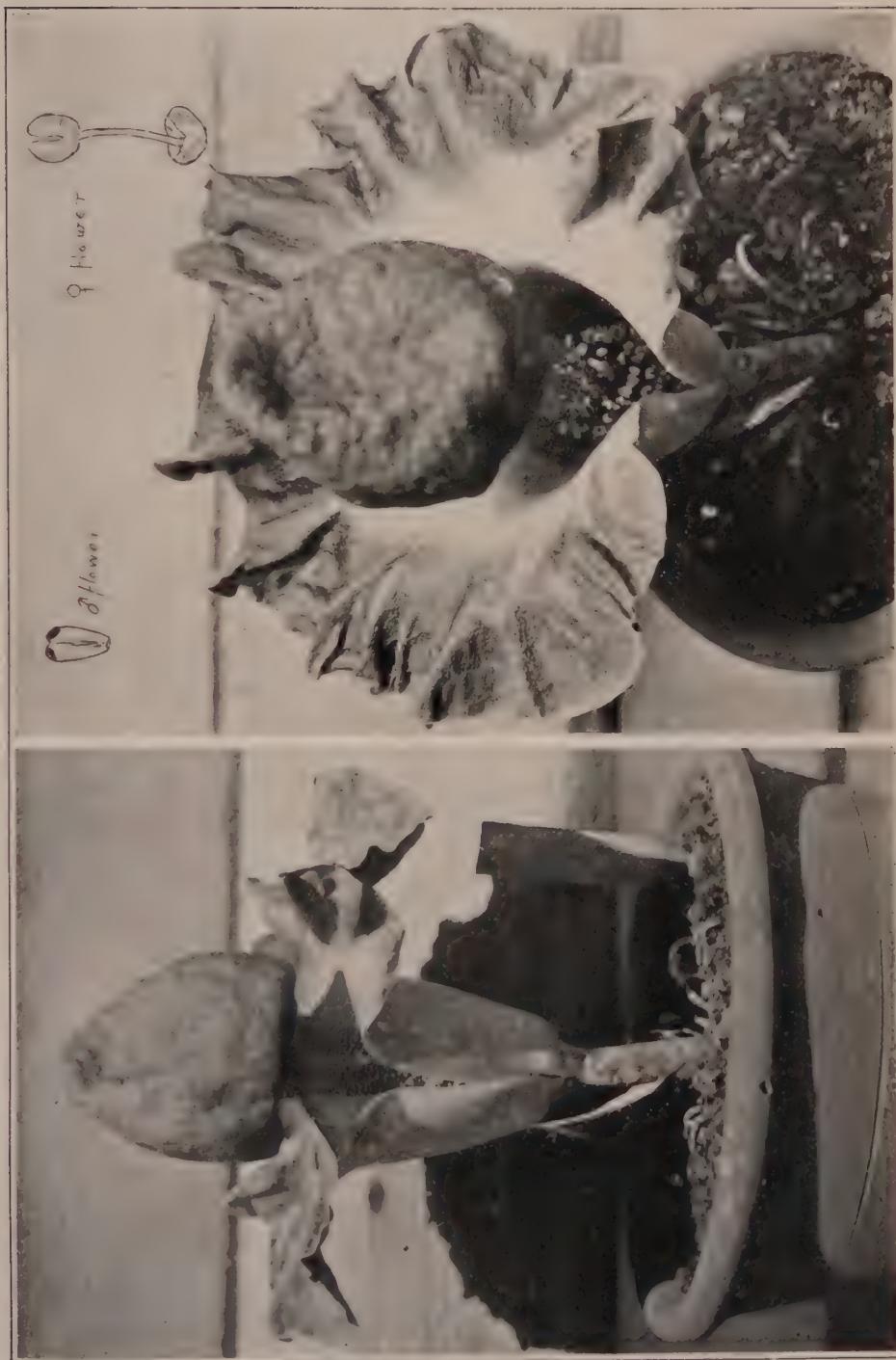


PLATE 16.—*AMORPHOPHALLUS CAMPANULATUS*, Blume, FORMA DARNLEYENSIS, *Bull. n. form.* (Specimen grown in an 8-in. pot.)

General Notes.

COCO-NUTS—THE CONSOLS OF THE EAST.

This work which has been received in the islands—the Solomons, Papua, and Malaya—with great favour, was eagerly taken up as to its first edition. Mr. Hamel Smith, editor of the "Tropical Life," author of the book, has now issued a second edition, the first being exhausted. This edition was completed last Christmas, and copies will probably be shortly obtainable in Brisbane. The price of the first edition was 11s. posted, but so much additional matter (some 200 pages) has been included, that the price has been raised to 12s. 6d., or 13s. 6d. post free. The additional sections will include:—

1. The cost of making copra.
2. The Nasicornus beetle fungus.
3. Cost of planting and making copra in Trinidad, B.W.I.
4. Horses (Army remounts) and cattle on coco-nut estates.
5. The manufacture of coir will be entirely rewritten and brought up to date.
6. Edible butter and its manufacture.
7. Samoa notes *re* Rhino Beetle, and present prospects.
8. The Solomon Islands.
9. Mr. H. H. Thiele, Secretary of the Fiji Planters' Association, on "Coco-nuts in Fiji."
10. Farming with dynamite, &c.

It will therefore be seen that the new book will be considerably extended and brought up to date in every way possible.

THE WATER HYACINTH AS A FIBRE PLANT.

The water hyacinth (*Eichornia crassipes*) was introduced into Cambodia about the year 1902, probably from the Philippines or Java. Since then it has spread with extraordinary rapidity, and now occurs in such masses on the rivers that navigation is impeded. It has become necessary to take steps to clear the waterways by collecting the plants by means of booms placed diagonally across the stream and to remove and burn the plants as they accumulate above the boom.

A French professor, Professor Perrot, has recently communicated to the Saigon Chamber of Commerce his opinion that this dreaded water hyacinth is likely to give rise to a new industry. He states that the plant possesses strong fibres which give every promise of being of great value for textile purposes. He has extracted the fibre from the stalk in a Duchemin machine, and finds that, after drying it in the shade, it is

quite fit for use. Rope and twine have been made from it, as well as coarse thread suitable for matting and sail cloth, while a local use is indicated for it in its employment for the manufacture of rice sacks in place of jute. On the native loom it affords a strong flexible cloth of about the same strength as jute. The fibre takes dyes readily, and its tenacity is highly satisfactory. Its weight is about the same as that of jute, but can be diminished by treatment with chrome alum; this treatment makes the material waterproof. By Perrot's process, which can be carried out by native workers, 100 kilogrammes of green stems yield 4.5 kilos of fibre. (Sisal leaves yield from $3\frac{1}{2}$ to 4 per cent.—Ed. "Q.A.J.")

If this information proves correct, it will be good news for countries which are cursed with the water hyacinth. It sounds rather too good to be true, at least with the plant as we know it in Ceylon. In any case, it would hardly be advisable to introduce it into another country as a fibre plant, but its successful use as such might afford some compensation to those countries which have unfortunately acquired it.—"Tropical Agriculturist," Ceylon.

PUBLICATIONS RECEIVED.

CABINET TIMBERS OF AUSTRALIA.

By RICH. T. BAKER.

The casual traveller in the timbered districts of Australia, unless he be interested in forestry or the timber trade, can have no conception of the vast variety of the native timbers of our scrubs and forests which lend themselves to utilitarian purposes, whether for the requirements of our railways, for sleepers, bridges, &c., for house-building, or for the more delicate and aesthetic work of the cabinetmaker and upholsterer. Many such travellers class all Australian timbers as "Gum Trees." It needs only a visit to our Railway Workshops to convince anyone that Australian forests contain quantities of the most beautiful woods for decorative purposes, which would gladly be utilised in all European manufacturing centres. As to those timbers most suitable for cabinet work, it needs but a glance at a publication on these which we have just received from the author, Mr. Rich. T. Baker, Curator and Economic Botanist of the Technological Museum, Sydney, to show the infinite variety of species of such timbers which is to be found in our forests. As Mr. Baker remarks in a preface to the work: "Several factors were instrumental in bringing about the writing of this publication, amongst which was the fact that some of these beautiful woods, owing to the rapid advance of the settler, are in jeopardy of being exterminated altogether, and that, by bringing these in this form before the commercial world, it is hoped the various Forestry Departments of the Commonwealth may be moved to set apart reserves for their reafforestation before it is too late."

The book itself is profusely and beautifully illustrated by colour photography, so perfectly executed that we had no difficulty in recognising them when comparing them with the hundreds of beautiful

polished specimens of the cabinet woods depicted, which are on view at the Technological Museum of our Queensland Department of Agriculture. As the New South Wales Minister for Public Instruction says in the introduction: "These coloured illustrations speak louder than words," and "such a technical work as this shows without doubt that our forest trees are worthy of more attention than has been given them in the past, and that they deserve to be still better known in the future." As a work of reference, also, Mr. Baker's work should prove invaluable to students of the various branches of the decorative art in our technical colleges, whom the author has placed under deep obligation by placing within their reach such an excellent *vade mecum* on our cabinet timbers.

Answers to Correspondents.

BUDGING THE MANGO.

G. WILLIAMS, Cairns—

Thanks for your paper on budding the mango, which arrived too late to publish in the February issue of the Journal, but will appear in the following issue.

BRUSSELS SPROUTS.

MARKET GARDENER, Middle Ridge—

Yes, you can grow Brussels sprouts on the Range. A feature of the crop is that it does not require the land to be too rich. If it is, the stems grow lanky, and the sprouts become soft, and inclined to open, as is the case when planted on the coast lands, where they never attain the solidity which is their characteristic when grown in a cold climate. If the seeds are sown in February, or as late as June, you may be fairly sure of success, given a fair season and suitable conditions of soil and climate. The cultivation is the same as for cabbages, but they require more room. When transplanting, the proper distance is 3 ft. between the rows, and the plants 2 ft. apart. To facilitate the formation of the sprouts (which are only diminutive cabbages), the large leaves should be broken down at all the joints in the stem. The sprouts will then form in a thick cluster round the stem from the root to the top.

They should be gathered when they look like half-open rose-buds, and it is advisable, when removing the first crop of sprouts, to do so with a sharp knife, so as to avoid making a large wound, which would be the case if they were plucked off by hand.

If any manure is required, farmyard manure may be dispensed with, its place being taken, as in the case of cauliflower, by artificial, using per acre (or proportionately per perch) 6 ewt. superphosphate, 4 ewt. kainit, and 6 ewt. of nitrate of soda (the latter in two or three dressings). If farmyard manure is procurable, then apply 12½ tons farmyard manure, 4 to 6 ewt. superphosphate, 4 ewt. kainit, and 4 ewt. nitrate of soda (the latter in two dressings).

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JANUARY, 1914.

Article.								JANUARY.	
								Prices.	
Bacon	lb.	9d. to 10½d.							
Bran	ton	£5							
Butter	cwt.	104s.							
Chaff, Mixed	ton	£4 10s. to £6 10s.							
Chaff, Oaten (Victorian)	"	£6 to £7							
Chaff, Lucerne	"	£5 to £7							
Chaff, Wheaten	"	£2 15s. to £4							
Cheese	lb.	6½d.							
Flour	ton	£9							
Hams	lb.	1s. 3½d.							
Hay, Oaten (Victorian)	ton	£6 to £6 10s.							
Hay, Lucerne (Prime)	"	...							
Honey	lb.	1½d. to 3d.							
Maize	bush.	4s.							
Oats	"	...							
Onions	ton	£10 to £11							
Pollard	"	£5 5s.							
Potatoes	cwt.	£12 to £13							
Potatoes (Sweet)	"	3s.							
Pumpkins	bush.	3s. 8d.							
Wheat, Milling	doz.	7d. to 1s. 2d.							
Eggs	pair	6s.							
Fowls	"	5s. 6d. to 6s. 6d.							
Geese	"	3s. 6d. to 4s.							
Ducks, English	"	4s. 6d. to 5s. 6d.							
Ducks, Muscovy	"	...							
Turkeys (Hens)	"	...							
Turkeys (Gobblers)	"	...							

SOUTHERN FRUIT MARKETS.

Article.								JANUARY.	
								Prices.	
Bananas (Fiji), G.M., per case ...	...	...	...	...	...	...	...	14s. to 15s. 6d.	
Bananas (Fiji), G.M., per bunch ...	...	...	...	...	...	...	...	3s. 6d. to 9s.	
Bananas (Queensland), per case ...	...	...	...	...	...	...	...	9s. to 11s.	
Bananas (Queensland), per bunch ...	...	...	...	...	...	...	...	...
Mandarins (Local), Emperors, per case	...	...	...	...	...	...	...	...
Mandarins (Queensland), per case	...	...	...	...	...	...	...	...
Oranges (Local), Navel, per case	...	...	...	...	...	...	...	...
Oranges (Other), per case ...	...	...	...	...	...	...	...	...
Oranges (Queensland), per case ...	...	...	...	...	...	...	...	...
Papaw Apples (Queensland), per quarter-case	...	...	...	...	...	...	...	5s. to 6s.	
Passion Fruit (Queensland), per half-case	...	...	...	...	...	...	...	...
Pineapples (Queensland), (common), per case ...	...	...	...	...	...	...	...	...
Pineapples (Queensland), (Ripleys), per case ...	...	...	...	...	...	...	...	10s. to 12s.	
Pineapples (Queensland), (Queens), per double-case ...	...	...	...	...	...	...	...	7s. to 9s.	
Pineapples (Rough), ...	...	...	...	...	...	...	...	...
Strawberries (Local) per dozen punnets (quarts)	...	...	...	...	...	...	...	...
Tomatoes, per quarter-case	...	...	...	...	...	...	...	...

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JANUARY.
	Prices.
Apples, Eating (American), per case ...	10s. to 12s.
Apples, Eating (Stanthorpe), per case ...	6s. to 8s.
Apples, Cooking (American), per case ...	6s. to 7s.
Apples, Cooking (Stanthorpe), per case ...	5s. to 7s. 6d.
Apricots, per quarter-case ...	3s. to 5s.
Bananas (Cavendish), per dozen ...	2½d. to 4d.
Bananas (Sugar), per dozen ...	2d. to 3½d.
Cape Gooseberries, per quarter-case ...	...
Cherries (Local), per quarter-case ...	3s. to 7s.
Citrons, per cwt. ...	...
Cocoanuts, per sack ...	13s. to 14s.
Custard Apples, per case ...	...
Grapes (Local), per pound ...	1½d. to 2½d.
Lemons (Local), per case ...	6s. to 8s.
Lemons (Italian), 150 Fruits, per half-box ...	14s. to 16s.
Limes, per case ...	...
Mandarins, per case ...	...
Mangoes, per case ...	2s. 6d. to 5s.
Oranges (Italian), per case ...	16s. to 17s.
Oranges (other), per case ...	...
Papaw Apples, per quarter-case ...	1s. 6d. to 2s. 6d.
Passion Fruit, per quarter-case ...	3s. to 4s.
Peaches, per quarter-case ...	3s. 6d. to 4s.
Peanuts, per lb. ...	3d. to 3½d.
Pineapples (Ripley), per dozen ...	9d. to 2s. 6d.
Pineapples (Rough), per dozen ...	9d. to 1s. 0d.
Pineapples (Smooth), per dozen ...	5s. to 6s.
Plums, per quarter-case ...	3s. to 4s.
Rockmelons, per dozen ...	2s. to 6s.
Strawberries, per dozen pints ...	...
Tomatoes, per quarter-case ...	2s. to 3s. 6d.
Watermelons, per dozen ...	6s. to 8s.

TOP PRICES, ENOGGERA YARDS, DECEMBER, 1913.

Animal.	DECEMBER.
	Prices.
Bullocks ...	£13 12s. 6d. to £16 10s.
Cows ...	£7 17s. 6d. to £8 10s.
Merino Wethers ...	20s. 6d.
Crossbred Wethers ...	21s.
Merino Ewes ...	18s.
Crossbred Ewes ...	17s. 9d.
Lambs ...	18s. 6d.
Pigs (Porkers) ...	...

Farm and Garden Notes for March.

FIELD.—Take every opportunity of turning up the ground in readiness for sowing and planting winter crops. The main crop of potatoes should at once be planted. As the growth of weeds will now be slackening off, lucerne may be sown on deeply cultivated soil. The latter should be rich and friable, with a porous subsoil. The land should be thoroughly pulverised. Do not waste time and money in trying to grow lucerne on land with a stiff clay subsoil. Prepare the land a couple of months before sowing, care being taken to cross plough and harrow before the weeds have gone to seed. This ensures a clean field. Sow either broadcast or in drills. In the former case, 20 lb. of seed will be required; in the latter, 10 lb. A good stand of lucerne has been obtained with less quantities. Lucerne seed is worth from £5 10s. to £6 10s. per cwt. Should weeds make their appearance before the plants have sent down their tap roots, mow the field. Before they can again make headway enough to do any damage, the lucerne will be strong enough to hold its own against them. Harrow and roll the land after mowing. Gather all ripe corn. It is now too late to sow maize, even 90 Day, with any certainty of harvesting a crop of grain. Rye grass, prairie grass, oats, barley (in some districts, wheat), sorghum, vetches, carrots, mangolds, and Swede turnips may be sown. In Northern Queensland, sow tobacco seed, cowpea, carob beans, sweet potatoes, opium poppy, &c. Sow anatto, jack fruit, and plant kola-nut cuttings. Some temperate-zone vegetables may be planted, such as egg plant, potatoes, &c. Coffee-planting may be continued. Harvest kafir corn and paddy.

FLOWER GARDEN.—Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety. Amongst the many are—Amaryllis, anemone, arum, babiana, erinum, crocus, freesia, ranunculus, jonquils, iris, ixias, gladiolus, narcissus, Jacobean lilies, tigridia, tritonia.

All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould. Herbaceous plants and annuals which it is intended to raise from seed should be sown this month. Such are Antirrhinums (snapdragon), asters, cornflowers, dianthus, larkspurs, daisies, cosmea, candytuft, lupins, gaiardias, godetia, mignonette, poppies, pansies, phlox, sweet peas. Cannas now planted will require plenty of food in the shape of liquid manure. Put in cuttings of carnations. Chrysanthemums require attention in the way of disbudding, staking, watering with liquid manure, &c. Growers for exhibition will thin out to a few buds and protect the flowers from rain and sun. Dahlias should be looking well. To secure fine blooms, disbudding should be done.

Now, as to climbers which may now be planted. These are—*Allamanda Schotii* (beautiful yellow), *Antigonon leptopus*, a charming

cerise-coloured climber; *Aristolochia elegans*, handsome as an orchid and easily grown; *Aristolochia ornithocephala* (Dutchman's Pipe), very curious, large, always attracts attention; *Asparagus plumosa*, grows in any shady place; *Beaumontia grandiflora*, splendid white flower, grand for a fence, will grow 50 ft high; Bignonias of several kinds; Bougainvilleas, with their splendid leafy pink and purple flowers, rapidly clothe a fence or unsightly shed with a blaze of blossom; *Quisqualis indica*, a fine creeper, flowers pink, changing to white; Wistaria, purple and white. Most beautiful is the *Bauhinia scandens*, rarely seen about Brisbane. We grew a plant of this climber at Nundah, and it soon closed in the front of the veranda for a distance of over 80 ft. The leaves are very small, and in the flowering season it presents almost a solid mass of beautiful round bunches of blossoms, something like the hawthorn bloom—pink and white. It seeds freely, but the seeds are difficult to germinate, and when they have produced a plant it is still more difficult to rear it. A rooted sucker from the main stem will in all probability grow.

KITCHEN GARDEN.—During this month a very large variety of vegetable seeds may be sown in readiness for planting out where necessary in the autumn, which begins on the 20th of March. All unoccupied land should be roughly dug, and, where required, add well-decomposed manure. Transplant cabbage, cauliflower, celery, &c. Sow French beans, beet, carrot, turnips, radish, cabbage, cauliflower, cress, peas, mustard, &c. Former sowings should be thinned out and kept clear of weeds. Mulch round melon and cucumber beds with a good dressing of long stable manure as it assists in keeping the fruit clean and free from damp. Cucumbers, melons, French beans, and tomatoes should be looked for every day and gathered, whether required or not, for, if left on the vines to perfect their seeds, the plants will soon cease to be productive, or will form inferior, ill-shaped, and hence unsaleable fruit.

Orchard Notes for March.

THE SOUTHERN COAST DISTRICTS.

The marketing of the main crop of pineapples will continue to occupy the attention of growers; and as it is probable that the plantations have been allowed to get somewhat dirty during the previous month, they should be cleaned up as soon as ever the crop has been got off. The fruit of the new crop of citrus fruit will be showing signs of ripening towards the end of the month; and as the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps should be taken to prevent loss arising from this cause as far as possible.

Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on a barn floor, and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths, but also the fruit flies. The moths will be found clustered round the trap-fruits in large numbers, and can then be easily caught and destroyed. Fruit fly will also puncture such fruit; and if the fruit is destroyed before the larva reach maturity, a later crop of these insects is prevented from hatching out. Fruit flies may also be caught in large numbers by means of such artificially ripened fruits. The fruits are smeared with tanglefoot, and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house flies on specially prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit flies.

The yellow peach moth that does such damage to peaches in Spring, and that attacks corn, sorghum, cotton bolls, custard apples, and many other plants and fruits, often does a lot of damage to citrus fruits. It acts in a very similar manner to the second and later generations of the Codling moth of pomaceous fruits, in that it lays its eggs where two fruits touch, under the shelter of a leaf on the fruit, at the stem end of the fruit, and, in the case of navel oranges, in the navel itself; in fact, anywhere that there is a likelihood of the egg not being disturbed. The egg hatches out into a small spotted caterpillar, which eats its way into the fruit, causing it to ripen prematurely, and fall off. Where two fruits touch, it often eats into and destroys both, and it frequently leaves one fruit to go and destroy a second. It is a very difficult insect to deal with, owing to the number of fruits and plants on which it lives; but, as far as citrus fruits are concerned, the best remedy is undoubtedly to spray the fruit with a remedy that will destroy the young insect when it starts to eat the skin of the fruit. Bordeaux mixture has been found efficacious, but I am of opinion that spraying with Paris green and lime, Kedzie's mixture, or arsenite of lead, will also have good results. The latter poison is, in my opinion, well worth giving a thorough test, as it sticks to the fruit and leaves for a long time. Bordeaux mixture, either alone or in conjunction with Paris green or Kedzie's mixture, is, however, a good remedy, as not only will it destroy the larvae or prevent the moth from attacking the tree, but it is also the best remedy for black brand or melanose, as well as tending to keep all other fungus pests in check. Fight fruit fly systematically—both by means of the sticky fruit already recommended and by gathering all fly-infested fruit, such as guavas, late mangoes, kumquats, &c., as well as any oranges or mandarins that may have been infested, as if kept in check now there will be little loss throughout the season. A little fruit will be marketed towards the end of the month. See that it is gathered and sweated for seven days before

marketing, and don't gather it too immature. Beauty of Glen Retreat mandarins are often gathered and marketed as soon as they show signs of colouring. They are then as sour as a lemon, and anyone who is unlucky enough to buy them will steer off mandarins for some time to come. This variety should not be gathered till thoroughly ripe, as when marketed in an immature state it spoils the market, as it puts people off eating citrus fruit.

Clean up the orchard after the summer rains, and have everything ready for the marketing of the crop. See that there is a good supply of clean, dry, case timber on hand, as one of the greatest sources of loss in shipment is packing fruit in green cases.

Strawberry planting can be done throughout the month. Plant such berries as Federation on the lowest ground, and Aurie, Anetta, Trollop's Victoria, Glenfield Beauty on warm, well-drained soils. Prepare the land thoroughly, so that it is in perfect tilth, and in a fit state to retain moisture well; as on this, as much as anything, the success of the crop depends. Where new orchards are to be planted, get the land ready—not the clearing, which should have been done months ago, but the working of the land, as it is advisable to get it thoroughly sweetened before putting the trees in.

THE TROPICAL COAST DISTRICTS.

The Notes for February apply equally to March. See that bananas are netted—keep down weed growth, and market any sound citrus fruits. Clean up the orchards as well as possible, and keep pines clear. Get land ready where new orchards are to be set out, as tree-planting can be done during April and May. Pines and bananas can still be planted, as they will become well established before winter.

THE SOUTHERN AND CENTRAL TABLELANDS.

Finish the gathering of the later varieties of deciduous fruits, as well as grapes. Clean up the orchard, and get ready for winter. Get new land ready for planting; and where there are old, dead, or useless trees to be removed, dig them out and leave the ground to sweeten, so that when a new tree is planted to replace them the ground will be in good order.

In the drier parts, where citrus trees are grown, keep the land well worked, and water where necessary.